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IN re DIANE M. DILLON

No. 88-1245

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

919 F.2d 688; 1990 U.S. App. LEXIS 19768; 16 U.S.P.Q.2D (BNA) 1897

November 9, 1990, Decided

PRIOR HISTORY: [**1] Appealed from: United States Patent & Trademark Office Board of Patent Appeals and Interferences.

teaching, art compositions, unexpected, subject matter, combustion, unobvious, homolog, unpatentability

CASE SUMMARY:**LexisNexis(R) Headnotes**

PROCEDURAL POSTURE: Petitioner appealed the judgment of the United States Patent and Trademark Office Board of Patent Appeals and Interferences rejecting certain claims in a patent application.

OVERVIEW: Petitioner's patent application described and claimed her discovery that the inclusion of certain tetra-orthoester compounds in hydrocarbon fuel would reduce the emission of solid particulates during combustion of fuel. The Board of Patent Appeals and Interferences rejected her patent application, holding all the claims to be unpatentable on the ground of obviousness under 35 U.S.C.S. § 103. On appeal, the court held that properties had to be considered in the overall evaluation of obviousness and the lack of any disclosure of useful properties for a prior art compound might indicate a lack of motivation to make related compounds, thereby precluding a prima facie case. But, it was not correct that similarity of structure and a suggestion of the activity of an applicant's compounds in the prior art were necessary before a prima facie case was established.

OUTCOME: The court affirmed the judgment of the Board of Patent Appeals and Interferences rejecting certain claims in petitioner's patent application because petitioner failed to overcome the presumption of obviousness.

CORE TERMS: compound, prior art, prima facie, composition, obviousness, chemical, patent, fuel, invention, similarity, examiner, inventor's, newly discovered, tetra-orthoester, structurally, patentability, hydrocarbon, particulate, emission, motivation, rebuttal, tri-orthoester,

Patent Law > Claims & Specifications > Claim Language > Representative Claims

Patent Law > U.S. Patent & Trademark Office Proceedings > Appeals

Patent Law > U.S. Patent & Trademark Office Proceedings > Interferences > Patentability & Priority Determinations

[HN1] It is not the practice of the appellate court to review claims that an applicant has not separately argued at the Board of Patent Appeals and Interferences level, because, inter alia, the appellate court lacks the benefit of the Board's reasoned decision on the separate patentability of those claims.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN2] A prima facie case of obviousness is not deemed made unless both (1) the new compound or composition is structurally similar to the reference compound or composition and (2) there is some suggestion or expectation in the prior art that the new compound or composition will have the same or a similar utility as that discovered by the applicant.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN3] Structural similarity between claimed and prior art subject matter, proved by combining references or otherwise, where the prior art gives reason or motivation to make the claimed compositions, creates a prima facie case of obviousness, and that the burden (and opportu-

nity) then falls on an applicant to rebut that prima facie case. Such rebuttal or argument can consist of a comparison of test data showing that the claimed compositions possess unexpectedly improved properties or properties that the prior art does not have that the prior art is so deficient that there is no motivation to make what might otherwise appear to be obvious changes or any other argument or presentation of evidence that is pertinent.

Patent Law > Inequitable Conduct > General Overview
Patent Law > Nonobviousness > Evidence & Procedure
> Prima Facie Obviousness

Patent Law > Ownership > Patents as Property

[HN4] All evidence of the properties of claimed compositions and prior art must be considered in determining the ultimate question of patentability, but it is also clear that the discovery that a claimed composition possesses a property not disclosed for the prior art subject matter, does not by itself defeat a prima facie case. Each situation must be considered on its own facts, but it is not necessary in order to establish a prima facie case of obviousness that both a structural similarity between a claimed and prior art compound (or a key component of a composition) be shown and that there be a suggestion in or expectation from the prior art that the claimed compound or composition will have the same or a similar utility as one newly discovered by applicant. To the extent that *In re Wright*, 848 F. 2d 1554, suggests or holds to the contrary, it is overruled.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN5] The statement that a prima facie obviousness rejection is not supported if no reference shows or suggests the newly-discovered properties and results of a claimed structure is not the law.

Patent Law > Anticipation & Novelty > General Overview

Patent Law > Inequitable Conduct > Effect, Materiality & Scierter > General Overview

[HN6] The determination that a reference is from a nonanalogous art is two-fold. First, a court decides if the reference is within the field of the inventor's endeavor. If it is not, a court proceeds to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN7] Even substitution of an unobvious starting material into an old process does not necessarily result in an unobvious process.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN8] The established practice of rejecting closely-related compounds as prima facie obvious has been qualified by the rule that a presumption is not created when the reference compound is so lacking in any utility that there is no motivation to make close relatives.

Patent Law > Nonobviousness > Elements & Tests > General Overview

[HN9] Properties are relevant to the creation of a prima facie case in the sense of affecting the motivation of a researcher to make compounds closely related to or suggested by a prior art compound, but it is not required, as stated in the dissent, that the prior art disclose or suggest the properties newly-discovered by an applicant in order for there to be a prima facie case of obviousness.

COUNSEL: James H. Laughlin, Jr., Benoit, Smith & Laughlin, of Arlington, Virginia, argued for Appellant. With him on the brief was Gregory F. Wirzbicki, Unocal Corporation, Brea, California, of Counsel.

Fred E. McKelvey, Solicitor, Office of the Solicitor, of Arlington, Virginia, argued for Appellee. With him on the brief were Richard E. Schafer, Associate Solicitor and Joseph F. Nakamura.

Allen S. Melser and Linda J. Shapiro, Mason, Fenwick & Lawrence, of Washington, District of Columbia, were on the brief for Amicus Curiae Chemical Manufacturers Association.

William S. Thompson, President, American Intellectual Property Law Association, of Arlington, Virginia, was on the brief for Amicus Curiae American Intellectual Property Law Association. With him on the brief were Donald R. Dunner, Herbert H. Mintz, and Thomas L. Irving, Finnegan, Henderson, Farabow, Garrett & Dunner, of Washington, District of Columbia. Also on the brief was Harold C. Wegner, Wegner & Bretschneider, of Washington, District of Columbia, of Counsel.

Professor Irving Kayton, of Washington, District of Columbia, [**2] was on the brief for Amicus Curiae Professor Irving Kayton.

Robert A. Chittum, President, Rochester Patent Law Association, of Rochester, New York, was on the brief for Amicus Curiae Rochester Patent Law Association.

JUDGES: Nies, Chief Judge, Rich, Circuit Judge, Cowen, Senior Circuit Judge, Markey, * Newman, Archer, Mayer, Michel, Plager, Lourie, Clevenger, and Rader, Circuit Judges. Archer, Circuit Judge, with whom Markey and Michel, Circuit Judges, join, joining-in-part. Newman, Circuit Judge, with whom Cowen, Senior Circuit Judge, and Mayer, Circuit Judge, join, dissenting.

* Circuit Judge Markey vacated the position of Chief Judge on June 27, 1990.

OPINION BY: LOURIE

OPINION

[*690] LOURIE, Circuit Judge

Diane M. Dillon, assignor to Union Oil Company of California, appeals the November 25, 1987, decision of the Board of Patent Appeals and Interferences (Board) of the United States Patent and Trademark Office (PTO), Appeal No. 87-0944, rejecting claims 2-14, 16-22, and 24-37, all the remaining claims of patent application Serial No. 671,570 entitled "Hydrocarbon Fuel Composition." We affirm the rejection of all of the claims.¹

1 A panel of this court heard this appeal and reversed the Board on December 29, 1989. 892 F.2d 1554, 13 USPQ2d 1337. The PTO petitioned for rehearing and suggested rehearing in banc on February 12, 1990. Rehearing in banc was ordered on May 21, 1990, and the judgment which was entered on December 29, 1989, was vacated, the accompanying opinion being withdrawn.

[**3] *The Invention*

Dillon's patent application describes and claims her discovery that the inclusion of certain tetra-orthoester compounds in hydrocarbon fuel compositions will reduce the emission of solid particulates (*i.e.*, soot) during combustion of the fuel. In this appeal Dillon asserts the patentability of claims to hydrocarbon fuel compositions containing these tetra-orthoesters, and to the method of reducing particulate emissions during combustion by combining these esters with the fuel before combustion.

Claim 2 is the broadest composition claim:

2. A composition comprising: a hydrocarbon fuel; and a sufficient amount of at least one orthoester so as to reduce the

particulate emissions from the combustion of the hydrocarbon fuel, wherein the orthoester is of the formula:

[SEE ILLUSTRATION IN ORIGINAL]

wherein R[5], R[6], R[7], and R[8], are the same or different monovalent organic radical comprising 1 to about 20 carbon atoms.

The broadest method claim is claim 24:

24. A method of reducing the particulate emissions from the combustion of a hydrocarbon fuel comprising combusting a mixture of the hydrocarbon fuel and a sufficient [**4] amount of at least [*691] one orthoester so as to reduce the particulate emissions, wherein the orthoester is of the formula:

[SEE ILLUSTRATION IN ORIGINAL]

wherein R[5], R[6], R[7], and R[8], are the same or different monovalent organic radical comprising 1 to about 20 carbon atoms.

The other claims contain additional limitations and thus are narrower in scope.

The tetra-orthoesters are a known class of chemical compounds. It is undisputed that their combination with hydrocarbon fuel, for any purpose, is not shown in the prior art, and that their use to reduce particulate emissions from combustion of hydrocarbon fuel is not shown or suggested in the prior art.

The Rejection

The Board held all of the claims to be unpatentable on the ground of obviousness, 35 U.S.C. § 103, in view of certain primary and secondary references. As primary references the Board relied on two Sweeney U.S. patents, 4,390,417 ('417) and 4,395,267 ('267). Sweeney '417 describes hydrocarbon fuel compositions containing specified chemical compounds, *viz.*, ketals, acetals, and tri-orthoesters,² used for "dewatering" the fuels, particularly [**5] diesel oil. Sweeney '267 describes three-component compositions of hydrocarbon fuels heavier than gasoline, immiscible alcohols, and tri-orthoesters, wherein the tri-orthoesters serve as cosolvents to prevent phase separation between fuel and alcohol. The Board

explicitly found that the Sweeney patents do not teach the use of the tetra-orthoesters recited in appellant's claims.

2 Tri-orthoesters have three -OR groups bonded to a central carbon atom, and the fourth carbon bond is to hydrogen or a hydrocarbon group (-R); they are represented as C(R)(OR)[3]. Tetra-orthoesters have four -OR groups bonded to a central carbon atom, and are represented as C(OR)[4]; see Dillon's claims, *supra*.

The Board cited Elliott U.S. Patent 3,903,006 and certain other patents, including Howk U.S. Patent 2,840,613, as secondary references. Elliott describes tri-orthoesters and tetra-orthoesters for use as water scavengers in hydraulic (non-hydrocarbon) fluids. The Board stated that the Elliott reference shows equivalence [**6] between tetra-orthoesters and tri-orthoesters, and that "it is clear from the combined teachings of these references. . . that [Dillon's tetra-orthoesters] would operate to remove water from non-aqueous liquids by the same mechanism as the orthoesters of Sweeney."

The Board stated that there was a "reasonable expectation" that the tri- and tetra-orthoester fuel compositions would have similar properties, based on "close structural and chemical similarity" between the tri- and tetra-orthoesters and the fact that both the prior art and Dillon use these compounds as "fuel additives." The Commissioner argues on appeal that the claimed compositions and method "would have been *prima facie* obvious from combined teachings of the references." On this reasoning, the Board held that unless Dillon showed some unexpected advantage or superiority of her claimed tetra-orthoester fuel compositions as compared with tri-orthoester fuel compositions, Dillon's new compositions as well as her claimed method of reducing particulate emissions are unpatentable for obviousness. It found that no such showing was made.

The Issue

The issue before this court is whether the Board erred in rejecting [**7] as obvious under 35 U.S.C. § 103 claims to Dillon's new compositions and to the new method of reducing particulate emissions, when the additives in the new compositions are structurally similar to additives in known compositions, having a different use, but the new method of reducing particulate emissions is neither taught nor suggested by the prior art.

[*692] *The Broad Composition Claims*

Claim 2, the broadest composition claim, comprises a hydrocarbon fuel and an amount of tetra-orthoester sufficient to reduce the particulate emissions from the combustion of the hydrocarbon fuel. The other composi-

tion claims contain various limitations including a minimum amount of emission reduction to be achieved (claim 3), percentages of ester in the fuel (claims 4, 5, 16, 20, 21), use of different esters (claims 6-10, 17-19), use of different fuels (claims 11-14, 22), and the requirement that the composition be essentially free of alcohol (claims 36, 37).

The Board stated in its opinion that, to the extent that appellant had not chosen to separately argue the patentability of the appealed claims, "they stand or fall together," citing *In re Kaslow*, 707 F.2d 1366, 1376, 217 U.S.P.Q. (BNA) 1089, 1096 (Fed. Cir. 1983). [**8] We agree with the Board except as noted briefly below. [HN1] It is not the practice of this court to review claims that an applicant has not separately argued at the Board level, because, *inter alia*, we lack the benefit of the Board's reasoned decision on the separate patentability of those claims. *Id.* at 1376, 217 U.S.P.Q. (BNA) at 1096; *In re Herbert*, 59 C.C.P.A. 1091, 461 F.2d 1390, 1391, 174 U.S.P.Q. (BNA) 259, 260 (CCPA 1972). We will therefore review only the merits of the composition claims, as did the Board.

The Board found that the claims to compositions of a hydrocarbon fuel and a tetra-orthoester were *prima facie* obvious over Sweeney '417 and '267 in view of Elliott and Howk. We agree. Appellant argues that none of these references discloses or suggests the new use which she has discovered. That is, of course, true, but the composition claims are not limited to this new use; *i.e.*, they are not physically or structurally distinguishable over the prior art compositions except with respect to the orthoester component. We believe that the [**9] PTO has established, through its combination of references, that there is a sufficiently close relationship between the tri-orthoesters and tetra-orthoesters (see the cited Elliott and Howk references) in the fuel oil art to create an expectation that hydrocarbon fuel compositions containing the tetra-esters would have similar properties, including water scavenging, to like compositions containing the tri-esters, and to provide the motivation to make such new compositions. Howk teaches use of both tri- and tetra-orthoesters in a similar type of chemical reaction. Elliott teaches their equivalence for a particular practical use.

Our case law well establishes that such a fact situation gives rise to a *prima facie* case of obviousness. See *In re Shetty*, 566 F.2d 81, 85, 195 USPQ 753, 755-56 (CCPA 1977); *In re Albrecht*, 514 F.2d 1385, 1388, 185 USPQ 590, 593 (CCPA 1975); *In re Murch*, 59 C.C.P.A. 1277, 464 F.2d 1051, 1054, 175 U.S.P.Q. (BNA) 89, 91 (CCPA 1972); *In re Hoch*, 57 C.C.P.A. 1292, 428 F.2d 1341, 1343, 166 U.S.P.Q. (BNA) 406, 409 (CCPA 1970).

Appellant cites *In re Wright*, 848 F.2d 1216, 1219, 6 USPQ2d 1959, 1961 (Fed. Cir. 1988), [**10] for the

proposition that a *prima facie* case of obviousness requires that the prior art suggest the claimed compositions' properties and the problem the applicant attempts to solve. The earlier panel opinion in this case, *In re Dillon*, 892 F.2d 1554, 13 USPQ2d 1337 (now withdrawn), in fact stated "a [HN2] *prima facie* case of obviousness is not deemed made unless both (1) the new compound or composition is structurally similar to the reference compound or composition and (2) there is some suggestion or expectation in the prior art that the new compound or composition will have the same or a similar utility as that discovered by the applicant." *Id.* at 1560, 13 USPQ2d at 1341 (emphasis added).

This court, in reconsidering this case *in banc*, reaffirms that [HN3] structural similarity between claimed and prior art subject matter, proved by combining references or otherwise, where the prior art gives reason or motivation to make the claimed compositions, creates [**11] a *prima facie* case of obviousness, and that the burden (and opportunity) then falls on an applicant to rebut that *prima facie* case. Such rebuttal or argument can consist of a comparison of test data showing that the claimed compositions possess unexpectedly improved properties or properties that the prior art does [**693] not have (*In re Albrecht*, 514 F.2d 1389, 1396, 185 USPQ 585, 590 (CCPA 1975); *Murch*, 464 F.2d at 1056, 175 USPQ at 92), that the prior art is so deficient that there is no motivation to make what might otherwise appear to be obvious changes (*Albrecht*, 514 F.2d at 1396, 185 USPQ at 590; *In re Stenmiski*, 58 C.C.P.A. 1410, 444 F.2d 581, 170 USPQ 343 (CCPA 1971); *In re Ruschig*, 52 C.C.P.A. 1238, 343 F.2d 965, 145 USPQ 274 (CCPA 1965)), or any other argument or presentation of evidence that is pertinent. [HN4] There is no question that all evidence of the properties of the claimed compositions and the prior art must be considered in determining the ultimate question of patentability, [**12] but it is also clear that the discovery that a claimed composition possesses a property not disclosed for the prior art subject matter, does not by itself defeat a *prima facie* case. *Shetty*, 566 F.2d at 86, 195 USPQ at 756. Each situation must be considered on its own facts, but it is not necessary in order to establish a *prima facie* case of obviousness that both a structural similarity between a claimed and prior art compound (or a key component of a composition) be shown and that there be a suggestion in or expectation from the prior art that the claimed compound or composition will have the same or a similar utility as one newly discovered by applicant. To the extent that *Wright* suggests or holds to the contrary, it is hereby overruled. [HN5] In particular, the statement that a *prima facie* obviousness rejection is not supported if no reference shows or suggests the newly-discovered properties and results of a claimed structure is not the law.³

3 The earlier, now-withdrawn Dillon opinion, this opinion, and the dissent cite and rely on cases involving claims to chemical compounds, whereas this case involves compositions. The reason for this reliance is that, in this case, the principal difference between the claimed and prior art compositions is the difference between chemical compounds, viz., tri-orthoesters and tetra-orthoesters. Cases dealing with chemical compounds are therefore directly analogous here and, in view of the history of this case and its *in banc* status, we will make much comment on these cases in this opinion. We do not, however, intend to imply that in all cases involving claimed compositions, structural obviousness between involved chemical compounds necessarily makes the claimed compositions *prima facie* obvious.

[**13] Under the facts we have here, as described above, we have concluded that a *prima facie* case has been established. The art provided the motivation to make the claimed compositions in the expectation that they would have similar properties. Appellant had the opportunity to rebut the *prima facie* case. She did not present any showing of data to the effect that her compositions had properties not possessed by the prior art compositions or that they possessed them to an unexpectedly greater degree. She attempted to refute the significance of the teachings of the prior art references. She did not succeed and we do not believe the PTO was in error in its decision.

Appellant points out that none of the references relates to the problem she confronted, citing *In re Wright*, and that the combination of references is based on hindsight. It is clear, however, that appellant's claims have to be considered as she has drafted them, i.e., as compositions consisting of a fuel and a tetra-orthoester, and that Sweeney '417 and '267 describe the combination of a liquid fuel with a related compound, a tri-orthoester. While Sweeney does not suggest appellant's use, her composition claims [**14] are not limited to that use; the claims merely recite compositions analogous to those in the Sweeney patents, and appellant has made no showing overcoming the *prima facie* presumption of similar properties for those analogous compositions. The mention in the appealed claims that the amount of orthoester must be sufficient to reduce particulate emissions is not a distinguishing limitation of the claims, unless that amount is different [**694] from the prior art and critical to the use of the claimed composition. See *In re Reni*, 57 C.C.P.A. 857, 419 F.2d 922, 925, 164 USPQ 245, 247 (CCPA 1970). That is not the case here. The amount of ester recited in the dependent claims can be from 0.05-49%, a very broad range; a preferred range is 0.05-9%, compared with a percentage in Sweeney '417 approxi-

mately equimolar to the amounts of water in the fuel which the ester is intended to remove (.01-5%).

4 The dissent misinterprets this comment as indicating that claims to new compounds and compositions must contain a limitation to a specific use, and states that past cases have rejected this proposition. Our comment only points out that the composition claims on appeal are not structurally or physically distinguishable from the prior art compositions by virtue of the recitation of their newly-discovered use.

[**15] Appellant attacks the Elliott patent as non-analogous art, being in the field of hydraulic fluids rather than fuel combustion. We agree with the PTO that the field of relevant prior art need not be drawn so narrowly. As this court stated in *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986) (quoting *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979)):

[HN6] the determination that a reference is from a nonanalogous art is therefore two-fold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

Following that test, one concerned with the field of fuel oils clearly is chargeable with knowledge of Sweeney '417, which discloses fuel compositions with tri-orthoesters for dewatering purposes, and chargeable with knowledge of other references to tri-orthoesters, including for use as dewatering agents for fluids, albeit other fluids. These references [**16] are "within the field of the inventor's endeavor." Moreover, the statement of equivalency between tri- and tetra-orthoesters in Elliott is not challenged. We therefore conclude that Elliott is not excludable from consideration as non-analogous art. It is evidence that supports the Board's holding that the prior art makes the claimed compositions obvious, a conclusion that appellant did not overcome.

Appellant urges that the Board erred in not considering the unexpected results produced by her invention and in not considering the claimed invention as a whole. The Board found, on the other hand, that no showing was made of unexpected results for the claimed compositions compared with the compositions of Sweeney. We agree. Clearly, in determining patentability the Board was obligated to consider all the evidence of the properties of the claimed invention as a whole, compared with those of

the prior art. However, after the PTO made a showing that the prior art compositions suggested the claimed compositions, the burden was on the applicant to overcome the presumption of obviousness that was created, and that was not done. For example, she produced no evidence that her compositions possessed [**17] properties not possessed by the prior art compositions. Nor did she show that the prior art compositions and use were so lacking in significance that there was no motivation for others to make obvious variants. There was no attempt to argue the relative importance of the claimed compositions compared with the prior art. See *In re May*, 574 F.2d 1082, 1092-95, 197 USPQ 601, 609-11 (CCPA 1978).

Appellant's patent application in fact included data showing that the prior art compositions containing tri-orthoesters had equivalent activity in reducing particulate emissions (she apparently was once claiming such compositions with either tri-orthoesters or tetra-orthoesters). She asserts that the examiner used her own showing of equivalence against her in violation of the rule of *In re Ruff*, 45 C.C.P.A. 1037, 256 F.2d 590, 596, 118 USPQ 340, 346 (CCPA 1958). While we caution against such a practice, it is clear to us that references by the PTO to the comparative data in the patent application were not employed as evidence of equivalence between the tri- and tetra-orthoesters; the PTO was simply pointing out that the applicant did not or apparently could [**18] not make a showing of superiority for the claimed tetra-ester compositions over the prior art tri-ester compositions.

Other Claims

As indicated above, the Board held that it would not consider the appealed claims separately, [**695] since appellant did not. Nonetheless, appellant, in her brief before the Board, did refer generally to claims directed to fuels essentially free of alcohol (Brief at 32, J. App. at 122), and the Board, in its decision, did respond, stating that no objective evidence was presented to establish any different or unexpected results from limiting the amount of alcohol to less than 1%, *In re Dillon*, No. 87-0944, slip op. at 9-10 (Bd. Pat. App. & Int. Nov. 25, 1987). We agree. Moreover, Sweeney '417 describes compositions which also contain less than 1% alcohol, so there is no real distinction in the claims over the prior art.

Appellant also argued in her brief to the Board that she "must contest" the examiner's position concerning claims limited to no more than 5 or 9 volume percent added orthoester, mentioning claims 16-21 and 27-31. The Board did not expressly deal with these claims, but it is clear to us that, since these limits do not result [**19] in an amount of ester different from that disclosed to remove water in Sweeney '417, and no criticality is

shown for these limitations, the subject matter of these claims has not been shown to have been nonobvious.

Regarding the method claims, the Commissioner urges affirmance, citing *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), for the proposition that [HN7] even "substitution of an unobvious starting material into an old process does not necessarily result in an unobvious process." The PTO has, as the Commissioner urges here, applied *Durden* regularly to claims to processes of making and processes of using, on the ground that the type of step involved in the claimed process is not novel.⁵

5 See M. A. Litman, *Obvious Process Rejections Under 35 USC 103*, 71 JPTOS 775 (1989); H. C. Wegner, *Much Ado About Durden*, 71 JPTOS 785 (1989).

We make no judgment [**20] as to the patentability of claims that Dillon might have made and properly argued to a method directed to the novel aspects of her invention, except to question the lack of logic in a claim to a method of reducing particulate emissions by combusting. Suffice it to say that we do not regard *Durden* as authority to reject as obvious every method claim reading on an old *type of process*, such as mixing, reacting, reducing, etc. The materials used in a claimed process as well as the result obtained therefrom, must be considered along with the specific nature of the process, and the fact that new or old, obvious or nonobvious, materials are used or result from the process are only factors to be considered, rather than conclusive indicators of the obviousness or nonobviousness of a claimed process. When any applicant properly presents and argues suitable method claims, they should be examined in light of all these relevant factors, free from any presumed controlling effect of *Durden*. *Durden* did not hold that all methods involving old process steps are obvious; the court in that case concluded that the particularly claimed process was obvious; it refused to adopt an unvarying [**21] rule that the fact that nonobvious starting materials and nonobvious products are involved *ipso facto* makes the process nonobvious. Such an invariant rule always leading to the opposite conclusion is also not the law. Thus, we reject the Commissioner's argument that we affirm the rejection of the method claims under the precedent of *Durden*.

However, appellant did not argue in her brief the separate patentability of her method claims. The statement in her brief to the Board that "the invention 'as a whole' includes the property of the claimed compositions -- which property is taken advantage of in the method claims" (Brief at 22, J. App. at 112) is not such a separate argument, since it implies more an added argument for the patentability of the composition claims than an

argument that, even if the claimed compositions are found to have been obvious, the claimed methods were nonobvious for particularly stated reasons. Moreover, no such reasons were particularly stated by Dillon. We will therefore not analyze these claims separately and affirm the Board's rejection on that basis.

[*696] *The Dissent*

The strong assertions by the dissent and its treatment of some [**22] of the case law impel us to make the following comments:

The dissent argues that our decision is "contrary to the weight and direction of . . . precedent, as embodied in over three decades of decision"; that we are resurrecting the "Hass-Henze" Doctrine, which was "discarded thirty years ago"; and that our holding today "changes what must be proved in order to patent a new chemical compound and composition and its new use, and thus changes what is patentable." We have done none of the above.

What we have done is to decide the case before us on the basis of long-established principles which had provided a stable understanding of the chemical patent law until the issuance of the original panel opinion in this case which we have now vacated. Our intent is to restore the law to its state existing before that panel opinion.

The length of the dissent and the number of cases it discusses may convey the impression that the weight of past jurisprudence is contrary to our holding today. That is not the case. The cited cases are simply not controlling on the facts of the present case or they are not contrary. Many do not deal with the requirements of a *prima facie* case. Some involve [**23] process claims, not compound or composition claims. Others are not pertinent for other reasons.

In brief, the cases establish that if an examiner considers that he has found prior art close enough to the claimed invention to give one skilled in the relevant chemical art the motivation to make close relatives (homologs, analogs, isomers, etc.) of the prior art compound(s), then there arises what has been called a presumption of obviousness or a *prima facie* case of obviousness. *In re Henze*, 37 C.C.P.A. 1009, 181 F.2d 196, 85 USPQ 261 (CCPA 1950); *In re Hass*, 31 C.C.P.A. 895, 141 F.2d 122, 127, 130, 60 USPQ 544, 548, 552 (CCPA 1944). The burden then shifts to the applicant, who then can present arguments and/or data to show that what appears to be obvious, is not in fact that, when the invention is looked at as a whole. *In re Papesch*, 50 C.C.P.A. 1084, 315 F.2d 381, 137 USPQ 43 (CCPA 1963). The cases of *Hass* and *Henze* established the rule that, unless an applicant showed that the prior art compound lacked the property or advantage asserted for the

claimed compound, the presumption of unpatentability was not overcome.

[**24] Exactly what facts constituted a *prima facie* case varied from case to case, but it was not the law that, where an applicant asserted that an invention possessed properties not known to be possessed by the prior art, no *prima facie* case was established unless the reference also showed the novel activity. There are cases, cited in the dissent, in which a *prima facie* case was not established based on lack of structural similarity. See *In re Grabiak*, 769 F.2d 729, 732, 226 USPQ 870, 872 (Fed. Cir. 1985); *In re Taborsky*, 502 F.2d 775, 780-81, 183 USPQ 50, 55 (CCPA 1974). Some of the cited cases also contained language suggesting that the fact that the claimed and the prior art compounds possessed the same activity were added factors in the establishment of the *prima facie* case. E.g., *In re Zeidler*, 682 F.2d 961, 966, 215 USPQ 490, 494 (CCPA 1982); *In re Grunwell*, 609 F.2d 486, 491, 203 USPQ 1055, 1058 (CCPA 1979); *In re Payne*, 606 F.2d 303, 314, 203 USPQ 245, 255 (CCPA 1979); *In re Swan Wood*, 582 F.2d 638, 641, 199 USPQ 137, 139 (CCPA 1978); *In re Lamberti*, 545 F.2d 747, 751, 192 USPQ 278, 281 (CCPA 1976); [**25] *In re Susi*, 58 C.C.P.A. 1074, 440 F.2d 442, 445, 169 USPQ 423, 426 (CCPA 1971). Those cases did not say, however, as the dissent asserts, that, in the absence of the similarity of activities, there would have been no *prima facie* case.

For example, the dissent quotes a statement in *Grabiak* that "when chemical compounds have 'very close' structural similarities and similar utilities, without more a *prima facie* case may be made." 769 F.2d at 731, 226 USPQ at 871. That case does not state, as implied by the dissent, that without the similarity of utilities, there would not have been a *prima facie* case. A conclusion based on one set of facts does [**697] not necessarily rule out a similar conclusion with slightly different facts.

One case cited by the dissent as "rejecting the PTO's interpretation of *Henze* as establishing a 'legal presumption' of obviousness" was *In re Mills*, 47 C.C.P.A. 1185, 281 F.2d 218, 126 USPQ 513 (CCPA 1960). All that case decided, however, was that a one-carbon member of a homologous series is too far from the prior art disclosure of 8 to 12 members to justify the presumption. *Id.* [**26] at 223-24, 126 USPQ at 517-18.

We will not review all the cases cited in the dissent, but *Stemniski* is an important case, for it overruled *Henze* and *In re Riden*, 50 C.C.P.A. 1411, 318 F.2d 761, 138 USPQ 112 (CCPA 1963) (a case similar to *Henze*), "to the extent that [they] are inconsistent with the views expressed herein." 444 F.2d at 587, 170 USPQ at 348. The views that were expressed therein were that:

where the prior art reference neither discloses nor suggests a utility for certain described compounds, why should it be said that a reference makes obvious to one of ordinary skill in the art an isomer, homolog or analog or related structure, when that mythical, but intensely practical, person knows of no "practical" reason to make the reference compounds, much less any structurally related compounds?

Id. at 586, 170 USPQ at 347. Thus, *Stemniski*, [HN8] rather than destroying the established practice of rejecting closely-related compounds as *prima facie* obvious, qualified it by holding that a presumption is not created [**27] when the reference compound is so lacking in any utility that there is no motivation to make close relatives.

Albrecht followed this line of thinking when it held that the prior art compound so irritated the skin that it could not be regarded as useful and therefore did not create a motivation to make related compounds. 514 F.2d at 1392, 1395-96, 185 USPQ at 587, 590.

[HN9] Properties, therefore, are relevant to the creation of a *prima facie* case in the sense of affecting the motivation of a researcher to make compounds closely related to or suggested by a prior art compound, but it is not required, as stated in the dissent, that the prior art disclose or suggest the properties newly-discovered by an applicant in order for there to be a *prima facie* case of obviousness.

The dissent cites the seminal case of *Papesch*, suggesting that it rejected the principle that we now "adopt," thereby implying that we are weakening *Papesch*. We are doing nothing of the sort. *Papesch* indeed stated that a compound and all of its properties are inseparable and must be considered [**28] in the determination of obviousness. We heartily agree and intend not to retreat from *Papesch* one inch. *Papesch*, however, did not deal with the requirements for establishing a *prima facie* case, but whether the examiner had to consider the properties of an invention at all, when there was a presumption of obviousness. 315 F.2d at 391, 137 USPQ at 51. The reference disclosed a lower homolog of the claimed compounds, so it was clear that impliedly a *prima facie* case existed; the question was whether, under those circumstances, the biological data were admissible at all. The court ruled that they were, *id.* at 391, 137 USPQ at 51, and we agree with that result. The dissent quotes the brief passage at the end of the *Papesch* opinion to the effect that the prior art must "at least to a degree" dis-

close the applicant's desired property, *id.* at 392, 137 USPQ at 52, but this brief mention was not central to the decision in that case and did not refer to the requirements of a *prima facie* case. *Papesch* is irrelevant to the question of the requirements for a *prima facie* case, which is the question we have here.

The dissent refers to a number [**29] of cases, including *In re Lunsford*, 53 C.C.P.A. 986, 357 F.2d 380, 148 USPQ 716 (CCPA 1966), stating that the court had rejected the Patent Office's position of "structures only." That case must be understood in the context of the refusal of the examiner to consider any showing of improved properties, not in the context of a discussion whether a *prima facie* case was created. The compounds were conceded to be sufficiently close to the prior art that, without a showing [**698] of a significant difference in properties, they would have been obvious. *Id.* at 381, 148 USPQ at 717.

The dissent asserts that the *Shetty* case "diverged from the weight of [the court's] precedent" in holding that a *prima facie* case was made based on similarities of structure. The court, in that opinion, accepted the *prima facie* case and concluded that "appellant had offered no evidence of unobviousness, as by showing an actual difference in properties." 566 F.2d at 86, 195 USPQ at 756 (citing *Hoch*). The opinion does not suggest that the court was diverging from the weight of precedent.

The dissent mentions positions advanced by the Commissioner, [**30] including citing the *In re Mod*, 56 C.C.P.A. 1041, 408 F.2d 1055, 161 USPQ 281 (CCPA 1969) and *In re de Montmollin*, 52 C.C.P.A. 1287, 344 F.2d 976, 145 USPQ 416 (CCPA 1965) decisions. We do not, however, in today's decision necessarily adopt any positions of the Commissioner other than those stated in our opinion and note that neither *Mod* nor *de Montmollin* dealt with the requirements of a *prima facie* case. They concerned the question whether the existence of a new property for claimed compounds in addition to a property common to both the claimed and related prior art compounds rendered the claimed compounds unobvious. We are not faced with that question today.

Other cases, e.g., *In re Gyurik*, 596 F.2d 1012, 1018, 201 USPQ 552, 557-58 (CCPA 1979) ("no common-properties presumption rises from the mere occurrence of a claimed compound at an intermediate point in a conventional reaction yielding a specifically named prior art compound"), have qualified the original rule of the *Hass-Henze* cases, but it is clear that they have not enunciated a rule that, in order to make a *prima facie* case of obviousness, the examiner [**31] must show that the prior art suggests a new property discovered by applicant. In not accepting that principle today, as urged in the dissent,

we are therefore not retreating from the recent trend of case law development or changing the law.

Another example of the lack of direct pertinence of a case quoted in the dissent is *May*, which the dissent cites as an example of the consistent line of decisions to the effect that "both structure and properties must be suggested in the prior art before a *prima facie* case of obviousness was deemed made." This case does not state that both structure and properties "must" be suggested. The claimed and prior art compositions were both disclosed as having analgesic activity; it was conceded that a *prima facie* case was made out, but the court concluded that applicants had rebutted the presumed expectation that structurally similar compounds have similar properties with a showing of an actual unexpected difference of properties between the claimed compound and the prior art. 574 F.2d at 1095, 197 USPQ at 611. The applicant in that case thus made a showing that Dillon did not make in this case.

Properties must be considered [**32] in the overall evaluation of obviousness, and the lack of any disclosure of useful properties for a prior art compound may indicate a lack of motivation to make related compounds, thereby precluding a *prima facie* case, but it is not correct that similarity of structure and a suggestion of the activity of an applicant's compounds in the prior art are necessary before a *prima facie* case is established.

Conclusion

We affirm the Board's decision rejecting claims 2-14, 16-22, and 24-37.

AFFIRMED.

CONCUR BY: ARCHER (In Part)

CONCUR

ARCHER, Circuit Judge, with whom MARKEY and MICHEL, Circuit Judges, join, joining-in-part.

I join the majority opinion except to note that the comments on *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), are unnecessary to the decision of this case. The method claims were not rejected by the Board on the basis of that case and, in fact, were not separately considered by the Board. Until a rejection of a method claim based on *Durden* is appealed to this court and the issue fully briefed, it is premature to consider the scope and effect of [**699] *Durden*. Accordingly, I do not join this part of the majority [**33] opinion.

DISSENT BY: NEWMAN

DISSENT

NEWMAN, Circuit Judge, with whom COWEN, Senior Circuit Judge, and MAYER, Circuit Judge, join, dissenting.

The court today resolves certain disparities in the extensive body of precedent on the question of obviousness of new chemical compounds and compositions. However, these disparities are resolved in a way that is contrary to the weight and direction of this precedent, as embodied in over three decades of decision. The court departs from its considered development of the law governing patentability of new chemical compounds and compositions, and reinstates a rule of "structural obviousness". In so ruling the court not only rejects the weight of precedent, but also errs in the application of 35 U.S.C. §§ 101, 102, and 103.

The majority's holding that *prima facie* obviousness of new chemical compounds and compositions is determined based only on structural similarity to prior art compounds and compositions having a known use¹ is reminiscent of the "Hass-Henze Doctrine" of earlier days. This doctrine was discarded thirty years ago, and although it resurfaced on occasion, its original sweep was superseded by many years of [**34] judicial analysis. Review of this analysis shows the courts' evolving understanding of the characteristics of chemical inventions, particularly the inseparability of chemical properties and chemical structure, and the legal consequences of this scientific fact.

1 The court allows one exception, as I shall discuss.

Judicial decisions over the past three decades established the general rule that the determination of *prima facie* obviousness of new chemical compounds and compositions and their uses can not be based on chemical structure alone, but must also include consideration of all their properties, including those discovered by the applicant. This rule had important procedural and substantive consequences during patent examination, for it determined the *kind* of evidence and proof that was required of a patent applicant. The ruling of this *in banc* court changes what must be proved in order to patent a new chemical compound or composition, and thus changes what is patentable.

The body of precedent establishing the burdens of modern patent examination was developed in judicial decisions applying the 1952 Patent Act. As I shall discuss in greater detail, when patent examination showed that the prior art suggested the inventor's [**35] new chemical structure and the inventor's newly discovered property and use, a *prima facie* case of obviousness of the new chemical compound or composition and its use was deemed made.

The inventor could, of course, argue that the differences from the prior art were such that a *prima facie* case was not made. And the inventor could rebut the *prima facie* case of obviousness, by showing some unexpected difference in structure or properties and use, not apparent from the teachings of the prior art. Such rebuttal was generally presented in the form of comparative experimental data, whereby the inventor demonstrated that the properties of his or her new chemical compound or composition achieved some unobvious or unexpected result or advantage, as compared with the actual properties of the prior art structure. This rebuttal often required the inventor to go beyond the general teachings in the prior art, and prove that the prior art compound did not, in fact, possess the specific property and advantage of the new compound or composition. Such proofs were invariably required when the prior art suggested the general property and use discovered by the applicant. Many dozens of decisions [**36] of the CCPA and this court illustrate this procedure, and the variety of factual circumstances in which it has been invoked.

In accordance with the court's *in banc* holding,² a new chemical compound or composition [**700] is not patentable even when the prior art does not suggest that the new chemical compound or composition would have the applicant's newly discovered property and use, unless the applicant makes the same showing that is required when the prior art does suggest the applicant's new property and use.

2 The majority holds that a *prima facie* case of obviousness is made whenever the structure of the applicant's new compound or composition (or mechanical device) is "obvious" from that shown in the prior art, independent of whether the prior art suggests or makes obvious the applicant's newly discovered property and use. The majority allows an exception for situations where the prior art gives no "reason or motivation to make the claimed invention", and duly makes clear that this means motivation to make the new compound or composition for the prior art use, not for the applicant's newly discovered use. This exception comes into play only when the prior art structure has no known utility; and a few such situations are reported, e.g. *In re Stemniski*, 58 C.C.P.A. 1410, 444 F.2d 581, 170 USPQ 343 (CCPA 1971) (prior art compounds used only as intermediates), and *In re Albrecht*, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975) (no practical utility). Thus, according to the majority, when the prior art chemical compound or composition has no known use, the prior art provides no "reason or motivation" to make a structurally similar new compound or composition; and in such case the

prior art would not make a *prima facie* case of obviousness based on structural similarity alone.

While I welcome any reduction in the sweep of the court's holding, this exception is of trivial impact. In most cases the prior art compound or composition has some known use; and thus for most cases the majority's "motivation" test would be met based solely on similarity of structure. This is an important change of law. While the holdings of the prior law were not entirely consistent -- see the various CCPA opinions discussed *post* -- this *in banc* court now establishes the rule that will control all cases in the future.

[**37] The applicant is thus required to show "unexpected" properties and results, *whether or not* the prior art provides an expectation or suggestion of the properties and results disclosed in the patent application. And unless the applicant proves that the prior art structure does not actually possess the same unobvious property that the applicant discovered for the new structure, the court holds today that the new chemical compound or composition is not patentable. This is an incorrect application of the patent statute, and a rejection of the wisdom of precedent. Therefore, respectfully, I dissent.

I

THE LAW

A

The In Banc Issue

Diane M. Dillon appeals the decision of the PTO Board of Patent Appeals and Interferences, which had rejected all of Dillon's claims on the basis that "The claimed subject matter would have been *prima facie* obvious from the combined teachings of the references." The Commissioner, asking the court to choose between divergent decisions of the CCPA, stated the PTO position that *prima facie* obviousness should be based on chemical structure alone:

If the prior art suggests an inventor's compound or composition *per se*, that compound [**38] or composition would be *prima facie* obvious, regardless of the properties disclosed in the inventor's application.

Commissioner's brief at 24.

The majority of the *in banc* court adopts the Commissioner's position, expressly rejecting the panel's position that the properties and use discovered by the applicant must be considered in connection with determina-

tion of the *prima facie* case under *section 103*, thereby overruling all prior decisions that so held.³

3 It is the role of the *in banc* court to resolve "a precedent-setting question of exceptional importance", *Fed. Cir. R. 35(a)*, and not simply to second-guess the panel on the facts of a particular case.

I would hold that determination of whether a *prima facie* case of obviousness has been made requires consideration of the similarities and differences as to structure and properties and utility, between the applicant's new compounds or compositions and those shown in the prior art. The *Graham [v. John Deere Co., 383 U.S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545, 148 USPQ 459 (1966)]* [**39] factors can not be ignored in determination of the *prima facie* case under 35 [**701] U.S.C. § 103.⁴ As illustrated in precedent, pertinent considerations in determination of whether a *prima facie* case is made include the closeness of the prior art subject matter to the field of the invention, the motivation or suggestion in the prior art to combine the reference teachings, the problem that the inventor was trying to solve, the nature of the inventor's improvement as compared with the prior art, and a variety of other criteria as may arise in a particular case; all with respect to the invention as a whole, and decided from the viewpoint of a person of ordinary skill in the field of the invention.

4 35 U.S.C. § 103. A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. . . .

[**40] Of course not all these aspects will loom large in every case, but when present they must be considered. They are as pertinent to determination of the *prima facie* case as they are to the determination that is made after rebuttal evidence is adduced by the applicant. Structure alone, without consideration of the applicant's newly discovered properties, is an incomplete focus for consideration of these factors.

B

The Prima Facie Case

The *prima facie* case, as used in patent examination, means not only that the evidence of the prior art reasonably allows the examiner's conclusion of unpatentability, but also that the prior art compels such a conclusion as a matter of law, if the applicant produces no evidence to rebut it. *Black's Law Dictionary*, 1071 (5th Ed. 1979); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788

(*Fed. Cir.* 1984). See the discussion in *In re Mills*, 47 C.C.P.A. 1185, 281 F.2d 218, 222 & n.2, 126 USPQ 513, 516 & n.2 (CCPA 1960), of the "presumption of unpatentability" based on prior art, a judicial usage before the term "*prima facie* case" appeared in CCPA and board decisions.

Patentability is determined, [**41] in the first instance, by examination of the patent application in the PTO. The prior art is searched by the patent examiner, who determines whether a *prima facie* case of unpatentability is made based on what was known in the prior art. *Piasecki*, *supra*. The *prima facie* rejection may be challenged by the applicant on grounds such as that the rejection is insufficiently supported, or incorrect, or based on illogical reasoning; or, if a *prima facie* case is made, evidence may be adduced in rebuttal. *In re Heldt*, 58 C.C.P.A. 701, 433 F.2d 808, 811, 167 USPQ 676, 678 (CCPA 1970). The *prima facie* case is not "set in concrete", and upon the submission of rebuttal evidence the determination of obviousness *vel non* is made on the entire record. *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

The initial determination by the patent examiner is critical to further proceedings, for the presence or absence of a *prima facie* case of obviousness controls the need for the applicant to adduce rebuttal evidence of unobviousness. The procedure serves to clearly allocate the burdens of going forward and [**42] of persuasion as between the examiner and the applicant. *In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (*Fed. Cir.* 1984). It determines what the applicant must prove, and the kind of evidence the applicant must provide. Thus it determines what is patentable under the statute.

While many judicial decisions turn on the question of adequacy of the rebuttal evidence, the concern of the *in banc* court today is the issue of the *prima facie* case. For when, as here, no rebuttal evidence is presented, determination of the *prima facie* case is decision of the question of patentability.

As illustrated in Dillon's case, the question of whether there is a *prima facie* case of obviousness controls whether Dillon is required to prove that her newly discovered property of particulate (soot) reduction during combustion is not actually possessed by the prior art composition, when the prior [**702] art composition was not known or suggested to have this property. Dillon did not so prove, and the Commissioner urges that since Dillon's specification itself discloses that the prior art composition does possess this newly discovered property, the *prima facie* [**43] case based on structural similarity was not rebutted.

Heretofore, the courts generally recognized a controlling distinction between the two principal types of

factual situations that arise when a patent applicant's new chemical compound or composition has a structure that is "similar" to chemical structures shown in the prior art: (1) those where the prior art suggests, at least in general terms, that the new chemical compound or composition will have the applicant's newly discovered property and use; and (2) those where it does not. These factual situations have had different consequences with respect to whether a *prima facie* case of obviousness was made. The difference turned on whether or not the structure and properties and use of a new chemical compound or composition were suggested in the prior art. The distinction determined whether the applicant was required to come forward with rebuttal evidence, which often was in the form of new technological information not known to the prior art, in order to establish an "unexpected" difference between the properties discovered by the applicant and those actually possessed by the prior art structure.

This distinction brought [**44] a consistent application of the law of 35 U.S.C. § 103 to the examination of chemical inventions, for it established the framework wherein the law was applied to the facts of each case. The court today rejects this distinction, holding *in banc* that it suffices to show *prima facie* obviousness whenever the prior art describes a similar chemical structure, provided only that the prior art gives some "reason or motivation" to make the claimed chemical structure, "regardless of the properties disclosed in the inventor's application", in the Commissioner's words. This position is contrary to the weight and direction of precedent, as I shall illustrate, and is contrary to the statutory imperatives of Title 35.⁵

5 The majority's insistence that it is merely reinstating the *status quo ante* can not be, of course, for the *in banc* holding that the applicant's newly discovered properties and use are not considered in determining *prima facie* obviousness under section 103 (unless the prior art structure itself has no known use), such that the applicant must now prove that the prior art structure does not possess the newly discovered property and use, forecloses reliance on contrary precedent.

[**45] C

Precedent

It is critical to an effective patent system that there be consistent law, consistently applied, despite the great diversity of technologies that the patent system must serve. The law that is applied in determining whether a *prima facie* case of obviousness is made, as to new chemical compounds and compositions and their uses, has evolved from analysis of many different factual situations. The large number of decisions on this issue, of

this court and the CCPA, produced a rich body of precedent.

The following outline of precedent is chronological, and has its roots in cases decided before enactment of the 1952 Patent Act.

For a while, during an earlier period of modern chemistry, "structural obviousness" alone was deemed to create a presumption of unpatentability. Leading decisions were *In re Hass*, 31 C.C.P.A. 895, 141 F.2d 122, 127, 130, 60 USPQ 544, 548, 552 (CCPA 1944) and *In re Henze*, 37 C.C.P.A. 1009, 181 F.2d 196, 85 USPQ 261 (CCPA 1950). In these decisions the CCPA held that there was a presumption of obviousness based solely on the close similarity of structure of chemical homologs,⁶ regardless of the new property [****46**] and use that the applicant discovered. Thus a new compound, if a homolog of a known compound, was not patentable unless the applicant [****703**] overcame this presumption by showing that there was in fact a significant and unexpected difference in the actual properties⁷ of the new compound as compared with the actual, albeit unknown to the prior art, properties of the known homolog:

The burden is on the applicant to rebut that presumption by a showing that the claimed compound possesses unobvious or unexpected beneficial properties not actually possessed by the prior art homologue.

Henze, 181 F.2d at 201, 85 USPQ at 265 (emphases in original). This difference in properties was required to be shown to exist, whether or not the prior art suggested the property and utility discovered by the inventor for the new compound, and whether or not there was any reason to expect the prior art compound to have that property or utility. The court held:

It is immaterial that the prior art homologue may not be recognized or known to be useful for the same purposes or to possess the same properties as the claimed compound.

[****47**] *Id.* (emphasis in original).

⁶ A homolog is a chemical compound that differs from another compound only by one or more methylene groups. An "adjacent" homolog differs by precisely one methylene group. *Henze*, 181 F.2d at 200, 85 USPQ at 264.

⁷ As used in these decisions "property" and "utility" refer to the utilitarian property that complies with 35 U.S.C. § 101, and not to physical or chemical parameters not pertinent to patentability. *In re Krazinski*, 52 C.C.P.A. 1447, 347 F.2d 656, 659, 146 USPQ 25, 28 (CCPA 1965) ("a 'utility' is really a manifestation of a 'property'").

The courts soon expressed dissatisfaction with this rule. See the discussion, and cases cited, in *In re Mills*, 47 C.C.P.A. 1185, 281 F.2d 218, 126 USPQ 513 (CCPA 1960). In *Mills* the CCPA limited the *Henze* presumption to adjacent homologs, and rejected the PTO's interpretation of *Henze* as establishing a "legal presumption" of obviousness. [****48**] The court held that homology alone does not create an inference of unpatentability or shift the burden of persuasion, but is simply a fact "which must be considered with all other relevant facts before arriving at the conclusion of 'obviousness' specified in 35 U.S.C. § 103." *Id.* 281 F.2d at 224, 126 USPQ at 518.

Throughout the 1960's, and thereafter, the CCPA stressed that properties as well as structure were material to the patentability of new chemicals, and must be considered. The case of *In re Papesch*, 50 C.C.P.A. 1084, 315 F.2d 381, 137 USPQ 43 (CCPA 1963) is often cited for its statement that "a chemical compound and all of its properties are inseparable". *Id.* at 391, 137 USPQ at 51. See *Papesch* for citation of a number of decisions of the CCPA and other courts after *Henze*, illustrating judicial understanding that chemical structure is not severable from chemical (including biochemical) properties in patentability determinations; for it is the properties that determine the utility that is requisite to patentability.

The *Papesch* court rejected the principle that this court now adopts, for in [****49**] *Papesch* the court held that the prior art must disclose "at least to a degree" the applicant's desired property and utility. The court said:

The other factor of importance . . . is that the prior art disclosure was not merely of a structurally similar compound but also, at least to a degree, of the same desired property relied on for the patentability of the new compound. Such an "other factor" must of course be considered because it bears on the obviousness of the compound, which is, realistically and legally, a composite of both structure and properties.

Id. at 392, 137 USPQ at 52 (emphasis in original). The majority today disposes of this passage, long the bulwark of chemical practice, as "a brief mention", and "irrelevant" to the *prima facie* case. This passage has been rein-

forced myriad times after its appearance in *Papesch*, and has been a foundation of the *prima facie* case in examination of chemical patent applications for obviousness in terms of *section 103*.

Although the CCPA and the Patent Office at the time of *Papesch* did not generally use the terminology "*prima facie* case", the CCPA's holding that a compound is "realistically [**50] and legally, a composite of both structure and properties", underlies the requirement that both structure and properties be considered. *Papesch* and its [**704] extensive progeny establish that the prior art disclosure should be "at least to a degree, of the same desired property", *id.*, even for a homolog.⁸ Absent such disclosure, the *presumption* of unpatentability did not arise.⁹ This requirement, that both structure and properties be considered, simply continued when the terminology of the *prima facie* case was adopted to describe a legally sufficient case of obviousness under *section 103*.

8 Dillon's tetra-orthoester is not a homolog of the tri-orthoester. Nor is it an isomer. The majority opinion simply describes the tri-orthoester and tetra-orthoester structures as having "a sufficiently close relationship", without the precision of past decisions.

9 In Dillon's case such disclosure was absent. It is undisputed that Dillon's property of soot-reduction during combustion was not disclosed for the prior art compositions.

[**51] In *In re De Lajarte*, 52 C.C.P.A. 826, 337 F.2d 870, 143 USPQ 256 (CCPA 1964) the same principle was applied to a new composition. The CCPA held that similarity of chemical composition alone did not place on the applicant the obligation of proving that the prior art composition did not possess the applicant's newly discovered property and utility:

In the total absence of evidence in the record to indicate that the amber glass disclosed by Lyle would be expected to have desirable electrical insulating properties, we can find no justification for placing the burden on applicant to conduct experiments to determine the insulating properties of the colored glass disclosed by Lyle.

Id. at 874, 143 USPQ at 259. As in the modern usage of the *prima facie* case, the court held that the prior art must suggest both similar structure and property before the burden shifted to the applicant to prove unexpected dif-

ferences. De Lajarte's claims were to a novel glass composition having insulating properties. The prior art (Lyle) reference showed a glass composition having what the examiner called "very slight differences" in structure, and the [**52] properties of amber color and durability. The court said:

If one were making a colorless glass free of carbon and sulfur, there would be little reason for using the Lyle formula since it was primarily designed to enhance color stability. In the absence of any showing why it would be obvious to modify Lyle's glass, a "103 rejection" must be reversed.

Id. at 875, 143 USPQ at 259.

In *In re Ruschig*, 52 C.C.P.A. 1238, 343 F.2d 965, 145 USPQ 274 (CCPA 1965) the court again observed that the invention "indeed, is a 'conjunction of utility and product', though claimed as new compounds found to have the desired biological effect". (Emphasis in original.) The court criticized the PTO position that "the examiner and the board thought the compounds, looked upon as mere chemical formulae, would have been obvious". *Id.* at 973, 145 USPQ at 281. The court stated:

On the obviousness issue, the vague "basket" disclosure of possible uses in the French and Swedish patents and the equally vague disclosure of the Martin patent are unimportant. What is important is the fact that the utility *discovered by the appellants* is not disclosed [**53] in the prior art.

Id. at 977, 145 USPQ at 285 (emphasis in original).¹⁰

10 In *Ruschig* the court discussed the Commissioner's position that claims to compounds that are structurally similar to known compounds should "define" the newly discovered property on which patentability was based. The CCPA rejected such limitation, stating that "valuable inventions should be given protection of value in the real world of business and the courts". 343 F.2d at 979, 145 USPQ at 286.

The majority of the court today, remarking that "the composition claims are not limited to [Dillon's] new use", hints that the result might be different if they were. *Ruschig* and other cases

consistently rejected the proposition that claims to new compounds and compositions *must* contain a limitation to a specific use. Any change in this long-established practice requires careful thought. The majority also holds that Dillon's claim recitation of "a sufficient amount of [orthoester] to reduce the particulate emissions" is ineffective as a use limitation, adding uncertainty to claim draftsmanship.

[**54] That the utility discovered by the applicant must be at least suggested in the prior art, in order to establish *prima facie* unpatentability [*705] of new compounds and compositions that are structurally similar to known chemicals, is the common thread that ties most of the decisions of the CCPA and the Federal Circuit. I do not attempt to include all of the cases that illustrate this point. I do, however, include representative cases of divergent holding, and those that appear to be relied on by the majority.

For example, the Commissioner cites *In re de Montmollin*, 52 C.C.P.A. 1287, 344 F.2d 976, 145 USPQ 416 (CCPA 1965) as supporting authority. In *de Montmollin* the claimed invention was a new compound, described by the applicant as useful for dyeing wool and cotton. The reference showed structurally similar compounds useful for dyeing wool. The court concluded that the additional ability of *de Montmollin*'s claimed compound to dye cotton was not "sufficient to render the subject matter as a whole unobvious". *Id.* at 979, 145 USPQ at 417-18. This case simply illustrates determination of obviousness by comparing the structures and properties taught [*55] in the prior art with those disclosed by the applicant, and bringing judgment to bear on "the subject matter as a whole." *Id.* It does not support the position that a *prima facie* case under section 103 is made on structural similarity, regardless of the applicant's newly discovered property and use.

The principle that both structure and properties must be considered in connection with the *prima facie* case was directly treated in *In re Rosselet*, 52 C.C.P.A. 1533, 347 F.2d 847, 146 USPQ 183 (CCPA 1965), where the court held that "gross similarity" of chemical structure and the same area of pharmacological activity constituted a *prima facie* case of obviousness:

We agree with appellant's admonitions against deciding questions of chemical obviousness on the basis of structure alone, whether by means of a "mechanistic overlay" or otherwise. However, we think appellants have failed to present adequate evidence to overcome a *prima facie* showing of obviousness by reason of the admitted "gross structural similarities"

of the art compounds, coupled with the fact those compounds are shown to have utility in the same area of pharmacological [*56] activity.

Id. at 850, 146 USPQ at 185 (emphases in original).

Other decisions during this period illustrate varying judicial emphases, depending on the facts. When the compounds were quite closely related in chemical structure, as in the homologs and analogs of *In re Riden*, 50 C.C.P.A. 1411, 318 F.2d 761, 138 USPQ 112 (CCPA 1963), or the position isomers of *In re Mehta*, 52 C.C.P.A. 1615, 347 F.2d 859, 146 USPQ 284 (CCPA 1965), the court gave greater evidentiary weight to the structural similarities than when the structures were less directly comparable. However, the court regularly admonished that:

A compound is not, however, merely a structural formula; its properties as part of the whole must be considered.

Id. at 864, 146 USPQ at 287.

In *In re Lunsford*, 53 C.C.P.A. 986, 357 F.2d 380, 148 USPQ 716 (CCPA 1966) the court listed eight recent decisions in which it had rejected the Patent Office's position of "comparison of structures only":

Just how one finds the compounds "obvious" in the first instance, the examiner does not say, but apparently he envisions a comparison of structures [*57] only. That such an approach is not sanctioned by this court, although concededly the law was less well defined in June 1961, the date of the Examiner's Answer, can be seen, e.g., in *In re Krazinski*, [52 C.C.P.A. 1447], 347 F.2d 656, 146 USPQ 25 [(CCPA 1965)]; *In re Ruschig*, [52 C.C.P.A. 1238], 343 F.2d 965, 145 USPQ 274 [(CCPA 1965)]; *In re Ward*, [51 C.C.P.A. 1132], 329 F.2d 1021, 141 USPQ 227 [(CCPA 1964)]; *In re Lunsford*, [51 C.C.P.A. 1000], 327 F.2d 526, 140 USPQ 425 [(CCPA 1964)]; *In re Riden, Jr.*, [50 C.C.P.A. 1411], 318 F.2d 761, 138 USPQ 112 [(CCPA 1963)]; *In re Papesch*, [50 C.C.P.A. 1084], 315 F.2d 381, 137 USPQ 43 [(CCPA 1963)]; *In re*

919 F.2d 688, *; 1990 U.S. App. LEXIS 19768, **;
16 U.S.P.Q.2D (BNA) 1897

Petering, [49 C.C.P.A. 993], 301 F.2d 676, 133 USPQ 275 [(CCPA 1962)]; *In re Lambooy*, [49 C.C.P.A. 985], 300 F.2d 950, [*706] 133 USPQ 270 [(CCPA 1962)].

Id. at 382 n.2, 148 USPQ at 718 n.2 (emphasis in original). The court reiterated:

The discovered activities or properties are *part of* the things claimed, the compounds. . . . We, like [*58] the Patent Office, are required by the clear wording of *section 103* to regard it as a relevant portion of the invention "as a whole."

Id. at 384, 148 USPQ at 720 (emphasis in original).

In a companion case, *In re Lunsford*, 53 C.C.P.A. 1011, 357 F.2d 385, 148 USPQ 721 (CCPA 1966), the court again stressed that determination of obviousness must be based on both structure and properties. The court quoted the Patent Office position, in the examiner's words:

The argument that the "subject matter as a whole" under 35 U.S.C. 103 includes the compound and its utility is considered to be without merit.

Id. at 391, 148 USPQ at 725. The court once more firmly rejected that position:

It is reasonably clear that the examiner considered only the difference in *structures* between the claimed compounds and the prior art compounds.

Appellant was entitled to have differences between the claimed invention, *the subject matter as a whole*, and the prior art references of record evaluated.

Id. (emphases in original). Referring to 35 U.S.C. § 103, the court wrote: [*59]

It is not believed that [a person of ordinary skill in the art] would consider only the *structures* of the compounds[.]

Id. (emphasis in original).

These judicial analyses, written before the terminology of the *prima facie* case became routine in patent examination, nonetheless placed the burden on the examiner to come forward with prior art sufficient to support any purported suggestion of the applicant's properties:

Moreover, as a matter of law under 35 U.S.C. 103, the examiner must substantiate his "suspicions" on the basis of facts drawn from proper prior art. The issue to be resolved requires more than "suspicions;" it requires *facts*.

Id. (footnote omitted, emphasis in original).

The CCPA put "structural obviousness" in perspective when, again receiving this argument from the Commissioner, the court commented on the large numbers of yet-unmade compounds that would be "structurally obvious" to a chemist:

The solicitor has reargued in his brief the question of the obviousness of chlorpropamide to a chemist as a compound, that is, what we sometimes refer to as its "structural obviousness. [*60]" This is not a matter of dispute. We think appellant would concede that all 1,237,464 compounds he claims to be within the Ruschig et al. disclosure or the 38,556 compounds he claims to be within the broadest patent claim, are structurally obvious.

In re McLamore, 54 C.C.P.A. 1544, 379 F.2d 985, 989, 154 USPQ 114, 117 (CCPA 1967). Indeed, few of today's new chemicals have such imaginative structure that structurally similar compounds are not to be found in the prior art.¹¹ Nonetheless, the reasoning rejected in *McLamore* appeared two years later in the CCPA decision *In re Mod*.

¹¹ In 1980 the Supreme Court noted that over 4,848,000 compounds had been listed by the Chemical Abstracts Service. *Dawson Chemical Co. v. Rohm & Haas Co.*, 448 U.S. 176, 221 n.23, 100 S. Ct. 2601, 65 L. Ed. 2d 696, 206 USPQ 385, 407 n.23 (1980). In 1990 the ten millionth specific compound had been entered in the register. *Chemical & Engineering News*, February 26,

1990, p. 30. This count is of characterized compounds, and does not include theoretical permutations and combinations such as those calculated in *McLamore*.

[**61] *In re Mod*, 56 C.C.P.A. 1041, 408 F.2d 1055, 161 USPQ 281 (CCPA 1969) was described by the Commissioner as "on all fours" with Dillon's facts. Mod's new compounds were adjacent homologs and isomers of known compounds that were described in the prior art as insecticides. Mod's compounds had "antimicrobial activity against a variety of micro-organisms such as bacteria, yeast, and molds". *Id.* at 1055, 161 USPQ at 282. The court held Mod's compounds unpatentable [*707] for obviousness, referring to the close similarities of structure and remarking that Mod "did not deny" that his new compounds had insecticidal activity. The court in *Mod* did not discuss a "*prima facie* case", but stated that it was not sufficient for patentability that the antimicrobial activity of Mod's new compounds was unknown to the prior art. *Id.* at 1057, 161 USPQ at 283. In a decision analogous to the majority's holding today, the CCPA held that because Mod's new compounds would have been obvious for the prior art use as insecticides, they were unpatentable despite Mod's discovery of a "significant" new property. *Id.*

Mod has often been [*62] distinguished. See, e.g., *In re Albrecht*, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975), wherein the court directly contradicted *Mod*, as follows:

We are of the opinion that a novel chemical compound can be *nonobvious* to one having ordinary skill in the art notwithstanding that it may possess a known property in common with a known structurally similar compound.

Id. at 1395-96, 185 USPQ at 590 (emphasis in original). With rare exceptions *Mod* has not been followed; until today.¹²

¹² The facts in *Mod* are indeed on all fours with the facts now before us. In *Mod* the court held that the apparently shared property of insecticidal activity sufficed to make Mod's new (but structurally similar) compounds unpatentable for obviousness, despite Mod's discovery that his new compounds had the new property of antimicrobial activity. In Dillon's case the court holds that the presumptively shared property of water sequestration suffices to make Dillon's new (but struc-

turally similar) compositions unpatentable for obviousness, despite Dillon's discovery that her new compositions have the new property of soot reduction. In neither case did the prior art suggest or make obvious the applicant's newly discovered property. The absence of the term "*prima facie* case" from the *Mod* opinion does not distinguish it from the majority's holding today. A conclusion of obviousness must be legally sufficient under the statute, and for both *Mod* and Dillon the courts hold that on similar facts this conclusion is compelled as a matter of law.

[**63] Continuing the chronological review: In *In re Jones*, 56 C.C.P.A. 1293, 412 F.2d 241, 162 USPQ 224 (CCPA 1969) the court upheld the rejection of composition claims to a blend of polypropylene and an asbestos filler as *prima facie* obvious, for the reason that "the prior art suggests the combination generally for the primary purpose (*i.e.*, improved structural rigidity) for which it was made." *Id.* at 244, 162 USPQ at 226. Comparative data were properly required, for both structure and properties were suggested in the prior art.

The procedural and substantive rigor of the *prima facie* case in patent examination is again illustrated in *In re Godron*, 57 C.C.P.A. 1289, 428 F.2d 854, 166 USPQ 327 (CCPA 1970), wherein the court held that since a *prima facie* case of obviousness was not made as to a new glass composition having new and unobvious properties, it was unnecessary for the applicant to prove whether the prior art composition had the same property (the ability to wet graphite) as the applicant's composition:

We agree that it is improper to require comparative evidence where a reference is devoid of any suggestion of [*64] the claimed invention.

Id. at 855, 166 USPQ at 329.

This procedure was similarly applied to chemical process claims. For example, in *In re Freed*, 57 C.C.P.A. 1089, 425 F.2d 785, 165 USPQ 570 (CCPA 1970) the claimed invention was a single-step process for producing calcium pantothenate. The CCPA held that the examiner had failed to support a *prima facie* case, since the prior art disclosed only a two-step process. Since a *prima facie* case was not made, the court held that it was unnecessary to show unexpected results. *Id.* at 788 & n.5, 165 USPQ at 572 & n.5. See also, e.g., *In re Alul*, 468 F.2d 939, 943, 175 USPQ 700, 703-04 (CCPA 1972)

(since *prima facie* case not established, no need to consider contentions of unobvious results).

In *In re Kuderna*, 57 C.C.P.A. 1078, 426 F.2d 385, 165 USPQ 575 (CCPA 1970) the board held that a claimed carbamate compound, having utility as an insecticide, was *prima facie* obvious in view of structurally similar known carbamates described in the prior art as useful as insecticides. The court held that the applicant's showing [*708] of superior results demonstrated [**65] unobviousness, in view of the entirety of the relevant teachings of the prior art and the absence of anything "on which to base a prediction of the comparative insecticidal activities" of these carbamate compounds. *Id.* at 390, 165 USPQ at 579.

In *In re Hoch*, 57 C.C.P.A. 1292, 428 F.2d 1341, 166 USPQ 406 (CCPA 1970) the reference described a known compound and its use for "treatment of plant diseases"; the court held that a *prima facie* case of obviousness was made as to the applicant's structurally similar compound disclosed to be useful as a herbicide, stating:

On the face of it, "treatment of plant diseases" could mean usefulness in controlling plant-infesting organisms. . . . We are thus not persuaded that herbicidal properties are "contraindicated" by the [prior art] patent.

Id. at 1343, 166 USPQ at 408-09. *Hoch* simply illustrates the court's consideration of the closeness of the chemical structures (the only difference was between an acid and its ethyl ester) and the court's stated uncertainty about the relationship of the properties shown in the prior art and those disclosed by the applicant, in deciding [**66] whether a *prima facie* case was made.

The classical reasoning of the *prima facie* case is again illustrated for composition claims in *In re Susi*, 58 C.C.P.A. 1074, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). A composition comprising a polymer and a stabilizer was held *prima facie* obvious because a similar combination was suggested in the prior art for the same purpose, and *Susi*'s stabilizer compounds were similar in structure to known compounds having the known property of stabilizing similar polymers. *Id.* at 444, 169 USPQ at 425. Thus a showing of unobvious results was properly required, for both structure and properties of the new composition were suggested in the prior art.¹³

13 There is extensive precedent relating to chemical compositions as well as chemical compounds; see the sampling herein. The statement

by the majority that its *in banc* holding does not "necessarily" apply to "all cases" of chemical compositions will not add clarity and stability to the law. The court's holding today must be followed by patent examiners and patent applicants, and while I dissent from it, it is essential that inventors and examiners, producing and processing 150,000 new patent applications annually, know the law and practice that will control patentability.

[**67] Another routine illustration of the *prima facie* case based on similarity of both structure and properties, between the prior art and the claimed compound, is seen in *In re Ackermann*, 58 C.C.P.A. 1405, 444 F.2d 1172, 170 USPQ 340 (CCPA 1971). The board had rejected claims to an optical brightening agent as *prima facie* obvious from references describing structurally similar compounds having pronounced fluorescence and optical brightening properties. The CCPA agreed that a *prima facie* case had been made, since the "references also suggest that the art would expect the class of compounds as a whole to possess the general property of optical fluorescence"; but the court reversed on the question of sufficiency of the rebuttal evidence. *Id.* at 1176, 170 USPQ at 342-43.

In *In re Stemniski*, 58 C.C.P.A. 1410, 444 F.2d 581, 170 USPQ 343 (CCPA 1971) the court again held that similarity of structure alone was insufficient for *prima facie* unpatentability. The claimed new compounds were analogs of known diaryl-tin compounds, and the known compounds were described as having no established utility, although utilities were suggested by the [**68] court. The court observed that the prior art provided no motivation to make the claimed compounds for applicant's purpose, although "one of ordinary skill would suppose the properties or potential uses of the two groups of compounds would be similar." *Id.* at 585, 170 USPQ at 347.¹⁴

14 As pointed out at n.2, *supra*, the facts illustrated in *Stemniski*, where the prior art compounds assertedly had no known use, are the only circumstance wherein the majority allows that structural similarities alone do not make a *prima facie* case of obviousness under section 103. While a chemical compound may be of solely theoretical interest, it is hard to imagine a composition (or a mechanical device) with no known use; thus this exception has scant practical significance with respect to compositions and mechanical devices.

[*709] The *Stemniski* court remarked on "this court's failure to render consistent precedent" on the is-

sue of structural obviousness, *id.* at 585, 170 USPQ at 347, stating that [**69]

Henze, its predecessors and its progeny have met with their share of criticism over the years, both in this court, in other courts, and elsewhere.

Id. at 587, 170 USPQ at 348 (footnote omitted). The court confronted the Commissioner's argument on the sufficiency of structural similarity alone, and held:

To the extent that *Henze* and *Riden* are inconsistent with the views expressed herein, they no longer will be followed, and are overruled.

Id. at 587, 170 USPQ at 348.

In *In re Murch*, 59 C.C.P.A. 1277, 464 F.2d 1051, 175 USPQ 89 (CCPA 1972) the claims were directed to new polymer compositions described as having certain properties of toughness. A *prima facie* case was deemed made based on similar properties of toughness described for similar polymer compositions in the prior art; and was held rebutted based on evidence of improved weld line toughness. *Id.* at 1056, 175 USPQ at 92. Although the majority today cites *Murch* as supporting authority for "structural obviousness", the court in *Murch* distinguished *Mod* and *de Montmollin*, and reaffirmed reliance on *Papesch*. *Murch* is remote from [**70] a holding of *prima facie* obviousness based on structural similarity alone.

In *In re Freeman*, 474 F.2d 1318, 177 USPQ 139 (CCPA 1973) the court again distinguished *Mod* and *de Montmollin*, which had again been cited by the Commissioner for the position that structural similarity alone suffices to support a *prima facie* case of obviousness. The court stated:

We have recently pointed out that the rule derived from *Mod* and *de Montmollin* by the Patent Office is not supported by those cases.

Id. at 1322, 177 USPQ at 142. The court discussed the principle of the *prima facie* case as applied to section 103, explaining that if the evidence of obviousness of the claimed subject matter

is strong enough to establish a *prima facie* case, i.e., one which would prevail in

the absence of rebuttal evidence, we must go on to examine the evidence of non-obviousness before the legal conclusion called for by section 103 can be reached.

Id. The court stressed the need to consider all the evidence.

The claimed invention in *In re Mochel*, 470 F.2d 638, 176 USPQ 194 (CCPA 1972) was [**71] sodium glass compositions containing magnesium oxide, a component known for use in lithium glass compositions. The court held:

No suggestion appears in the record of a purpose for including MgO in sodium glasses and no teaching of identical effects of secondary components in sodium and lithium glasses. We do not consider it "fair to assume" [quoting the examiner] such identity. We cannot, therefore, sustain the finding of *prima facie* obviousness.

Id. at 641, 176 USPQ at 196.

In *In re Cescon*, 474 F.2d 1331, 177 USPQ 264 (CCPA 1973) the court reversed the rejection of compound claims, where the board had relied on known methods of making the compounds as evidence of obviousness, and the examiner had "totally disregarded" the showings of improved properties. The court stated:

It has long been our position that a compound and its properties are inseparable and that no property can be ignored in determining patentability over the prior art.

Id. at 1334, 177 USPQ at 266. The court found that the prior art did not suggest a relationship between the change in chemical structure and the applicant's [**72] phototropic properties. The court stated that it was insufficient that this type of chemical modification was known:

Nothing in the prior art suggests any relationship between ortho substitution in the 2-phenyl ring [the structural difference from the prior art] and the properties

[*710] disclosed and illustrated in appellant's specification.

Id. at 1334, 177 USPQ at 266-67. The court quoted with approval the following statement from *In re Larsen*, 49 C.C.P.A. 711, 292 F.2d 531, 533, 130 USPQ 209, 210 (CCPA 1961), cert. denied, 370 U.S. 936, 8 L. Ed. 2d 806, 82 S. Ct. 1580 (1962):

Since there was nothing to indicate that the compounds, when made, would have these properties, it was not obvious to make the compounds. In such a case the allowance of claims to the compounds must depend on the proposition that it was unobvious to conceive the idea of producing them, within the meaning of Title 35 U.S.C., Section 103.

Cescon, 474 F.2d at 1334, 177 USPQ at 266.

These cases illustrate the CCPA's continuing rejection of the "structural obviousness" [*73] theme, on the rationale that unless there was a reason or motivation shown in the prior art to make the particular structural change that the applicant made, in order to achieve the properties that the applicant was seeking, "it was not obvious to make the compounds." *Id.* As the court explained, the "idea" of new compounds is not separable from the properties that were sought by the inventor when making the compounds. Structure and properties are essential components of "the invention as a whole", in the words of section 103.

In *In re Taborsky*, 502 F.2d 775, 183 USPQ 50 (CCPA 1974) the prior art described a large number of isomers and analogs of the applicant's compounds. Taborsky's products were "halogen" compounds, discovered to be useful as selective piscicides against brown bullhead fish and as larvicides to control sea lampreys. The prior art compounds were described as controlling gastropods and snails. The *Taborsky* decision illustrates the care with which the court compared, compound by compound, the applicant's and the prior art's disclosure of structures and properties. As to the applicant's chlorine, bromine, and iodine analogs, the court remarked [*74] that it was unnecessary to pass on the issue of whether a *prima facie* case were made by the prior art's disclosure of related compounds containing these three halogens, because such case, if made, had been overcome by evidence of the comparative effectiveness of

these compounds as larvicides to control sea lampreys. *Id. at 781, 183 USPQ at 55.* As to the fluorine analogs, the *Taborsky* court held that the board's holding of *prima facie* obviousness "because of structural similarity to the cited prior art" could not stand, since there was "no motivation to make the proposed molecular modifications needed to arrive at appellant's claimed fluoro-substituted compounds." *Id. at 780-81, 183 USPQ at 55.* The court held that it was not necessary for the applicant to compare actual properties of the new and the prior art compounds:

Since we hold that the prior art of record fails to establish that the fluoro-substituted compounds recited in appellant's claims are *prima facie* obvious, it is unnecessary to consider any comparative evidence with respect to the properties of these compounds.

*Id. at 781, 183 USPQ at 55. [*75]*

Only when the *prima facie* case was established by the prior art was the applicant required to develop comparative evidence. It is as much an obligation to avoid imposing unnecessary burdens on the applicant, and on the Patent Office, as it is to assure compliance with the law. See, e.g., *In re Seigneurin*, 474 F.2d 1020, 1023, 177 USPQ 257, 259 (CCPA 1973) (since no *prima facie* case of obviousness was made for a catalyst component of a chemical process, "that concludes the matter"); *In re Fischer*, 484 F.2d 961, 963-64, 179 USPQ 304, 306 (CCPA 1973) (no *prima facie* case, therefore no need to show unexpected results of claimed method). While the CCPA did not always decline to consider such evidence when it was already of record, the principle underlying orderly patent examination is that the burden in the first instance is on the examiner to establish that the claimed invention is *prima facie* unpatentable based on the prior art.

The no-utility exception that is recognized in the majority opinion is seen in the [*711] following case. In *In re Albrecht*, 514 F.2d 1389, 185 USPQ 585 (CCPA 1975) (*Albrecht I*) [*76] the prior art compounds were described as anesthetics that had the disadvantage of being skin irritants and therefore were not of practical use. Albrecht's new compounds were antiviral agents. The claims were rejected as *prima facie* obvious based on similarity of structure; in the examiner's words:

Where such closely structurally related compounds are concerned, actual unex-

pected *differences* in properties are required to overcome a *prima facie* case of obviousness. Even though the present compounds may exhibit an unexpected property as anti-virals, they are obvious as anesthetics.

Id. at 1392, 185 USPQ at 587 (emphasis in original). The Commissioner argued that Albrecht must prove that his new compounds were not anesthetics. The court disagreed, holding that the properties shown in the prior art did not provide the "necessary impetus" to make Albrecht's compounds, *id. at 1396, 185 USPQ at 590*. The court also reaffirmed that properties must always be considered:

This court has several times recently expressed its position on the role of the properties of chemical compounds in assessing their obviousness under § 103. [**77] See *In re Taborsky*, 502 F.2d 775, 183 USPQ 50 (CCPA 1974); *In re Blondel*, 499 F.2d 1311, 182 USPQ 294 (CCPA 1974); see further *In re Murch*, [59 C.C.P.A. 1277], 464 F.2d 1051, 175 USPQ 89 (CCPA 1972); *In re Lintner*, [59 C.C.P.A. 1004], 458 F.2d 1013, 173 USPQ 560 (CCPA 1972).

Id. at 1394, 185 USPQ at 588-89. The court observed that Albrecht's newly discovered antiviral property is "totally dissimilar" to the properties disclosed for the prior art compounds, and is "not to be ignored":

A newly discovered activity of a claimed novel compound which bears no material relationship to the activity disclosed for the prior art analogs is further evidence, not to be ignored, of the nonobviousness of the claimed invention.

Id. at 1396, 185 USPQ at 590. The court reversed the rejection.

In *In re Albrecht*, 514 F.2d 1385, 185 USPQ 590 (CCPA 1975), decided the same day, the court held, as to other related compounds, that a *prima facie* case was made based on structural similarity to the compounds of the same prior art reference as in *Albrecht I*. The court disposed [**78] of the Commissioner's position that the applicant should have provided comparative data with the anesthetic property of the prior art compounds, as follows:

There seems to be little doubt that the Patent and Trademark Office would not have entertained such a comparison if initiated by appellants because they have no support in their specification for use of the claimed compounds as anesthetics. See *In re Davies*, 475 F.2d 667, 177 USPQ 381 (CCPA 1973).

Id. at 1389, 185 USPQ at 593. The court correctly observed that comparative data, when required to rebut a *prima facie* case, should relate to the new property and use discovered by the applicant, not an unrelated known use of the prior art products.

In *In re Lamberti*, 545 F.2d 747, 192 USPQ 278 (CCPA 1976) certain new compounds having germicidal activity were rejected as *prima facie* obvious over structurally similar compounds described as biological toxicants, a use that the court found may include germicidal activity, although not necessarily. *Id. at 750, 192 USPQ at 280*. Rebuttal evidence was adduced and found insufficient. The court concluded: [**79]

In view of the foregoing, and considering the claimed invention as a whole vis-a-vis the evidence produced by the PTO, which shows both a close structural similarity between the prior art compounds and the claimed compounds and a close similarity between the *disclosed* uses, we hold that appellants' invention would have been obvious to one of ordinary skill in the pertinent art.

Id. at 751, 192 USPQ at 281 (emphasis added).

The majority has cited *In re Shetty*, 566 F.2d 81, 195 USPQ 753 (CCPA 1977). Shetty's [**712] new compounds were homologs of known compounds that were described in the prior art as antiviral agents, whereas Shetty's compounds were discovered to have appetite-suppressant activity. Diverging from the weight of its precedent, the court held that a *prima facie* case was made based on the close similarities of chemical structure. Since Shetty did not prove that there were actual differences in properties, the composition claims were not allowed.

However, the *Shetty* court allowed the process claims (to the new use),¹⁵ without requiring such proof. The court said, following precedent:

The [**80] Patent Office has failed to show a reasonable expectation, or some predictability, that [a reference] compound would be an effective appetite suppressant if administered in the dosage disclosed by [another reference].

Id. at 86, 195 USPQ at 756. In contrast, the majority today affirms the rejection of Dillon's claims, process and composition, although such "expectation" or "predictability" was, without dispute, absent.

15 A new use is claimed as a process, in accordance with 35 U.S.C. § 100(b):

The term "process" means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

Despite the occasional aberration illustrated by *Shetty*, the CCPA decisions became remarkably consistent in requiring that both structure and properties must be suggested in the prior art before a *prima facie* case of obviousness was deemed made, whether for composition claims or process [**81] claims. *E.g.*, *In re May*, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978), wherein the prior art compounds were isomers of May's compounds, and showed the same analgesic activity. A *prima facie* case was conceded as to the composition and the process claims, and overcome by rebuttal evidence of the non-addictiveness of May's compounds, an attribute that was shown to be unpredictable.

Similar reasoning was applied to claims to a new use of a known compound in, *e.g.*, *In re Herschler*, 591 F.2d 693, 200 USPQ 711 (CCPA 1979), wherein the use of the known compound DMSO (dimethyl sulfoxide) to enhance steroid penetration through skin tissue was held by the board to be *prima facie* obvious from references showing DMSO in hair lotion preparations that may contain estrogenic hormones (steroids). The court reversed, holding that "the references do not provide any impetus to do what appellant has done". *Id.* at 702, 200 USPQ at 718-19. In the absence of a *prima facie* case, appellant's rebuttal evidence was unnecessary:

We do not find it necessary to reach the question of the weight to be given the papers presented to the New York [**82] Academy of Sciences in that appellant has no *prima facie* showing of obviousness to rebut.

Id. at 702 n.9, 200 USPQ at 719 n.9.

Over the remaining years of the CCPA's existence its opinions were steadfast in requiring consideration of both structure and properties in determinations of *prima facie* obviousness. Precedent had ripened, as exceptions diminished. See *Kotteakos v. United States*, 328 U.S. 750, 66 S. Ct. 1239, 90 L. Ed. 1557 (1946), wherein the Supreme Court discusses how case by case determination on a variety of facts in time shows the direction of the law:

For, as with all lines which must be drawn between positive and negative fields of law, the precise border may be indistinct, but case by case determination of particular points adds up in time to discernible direction.

328 U.S. at 761-62.

Further illustrations of the direction established by precedent are, *e.g.*, *In re Swan Wood*, 582 F.2d 638, 641, 199 USPQ 137, 139 (CCPA 1978):

In view of the close structural similarity between the claimed compounds and [the prior art compound], and the fact that [**83] the latter is disclosed as possessing anti-microbial activity, we believe that one skilled in the art would have been, *prima facie*, motivated to make the claimed [**713] compounds in the expectation that they, too, would possess antimicrobial activity.

In *In re Payne*, 606 F.2d 303, 203 USPQ 245 (CCPA 1979), the court stated:

The similarity in structure and properties between the prior art and claimed compounds is sufficiently close to support a *prima facie* case of obviousness.

Id. at 314, 203 USPQ at 255. The court explained:

An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound in the expectation that compounds similar in structure will have similar properties.

Id. at 313, 203 USPQ at 254.

In *In re Grunwell*, 609 F.2d 486, 203 USPQ 1055 (CCPA 1979) the court held that a *prima facie* case of obviousness was made for certain new steroids, and not for others. For compounds where the structures differed from the prior art only in a methyl substituent, [**84] and the physiologic and psychologic properties were similar, a *prima facie* case was deemed made. *Id.* at 491, 203 USPQ at 1059. Other Grunwell steroids were ethers, while the closest structures in the prior art were alcohols; in that case the court held that a *prima facie* case was not made, because the examiner had not shown why one skilled in the art would have replaced this hydroxyl group with an ether. *Id.*

Similar reasoning was applied to process claims in *In re Clemens*, 622 F.2d 1029, 206 USPQ 289 (CCPA 1980). Claims to the use of new polymeric exchange resins to remove corrosion products in a steam system were rejected as *prima facie* obvious from references describing structurally similar polymers used for the same purpose. However, the court found that the PTO did not make a *prima facie* case as to claim 8 because of temperature limitations not shown in the prior art. Therefore:

Since the PTO had not made out a *prima facie* case of obviousness respecting claim 8, evidence of comparative testing was unnecessary in rebuttal.

Id. at 1036, 206 USPQ at 296.

Again in *In re Zeidler*, 682 F.2d 961, 215 USPQ 490 (CCPA 1982) [**85] a *prima facie* case was deemed made based on similarity of structure and of properties:

One of ordinary skill would have had reason to expect, given the close structural similarity of the [reference] compounds and the teachings of [another reference], that use of a sulfonamide bridge . . . would have resulted in dyes possessing the same or only slightly different properties from prior art dyes.

Id. at 966, 215 USPQ at 494. The *prima facie* case was held rebutted as to one claimed dye compound, but not as to another. *Id.*

The Federal Circuit did not stray from this precedent. ¹⁶ As summarized in *In re Grabiak*, 769 F.2d 729, 731, 226 USPQ 870, 871 (Fed. Cir. 1985):

When chemical compounds have "very close" structural similarities and similar utilities, without more a *prima facie* case may be made.

The rule also continued to be applied to process (use) claims, as illustrated in *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986), wherein the court held that "close structural similarity and a similar use" of the applicant's known compound and the prior art compound [**86] made a *prima facie* case of obviousness of claims to the asserted new use. *Id.* at 1097, 231 USPQ at 379.

16 Although the majority states that it is "not retreating from the recent trend of case law", the cases over the past thirteen years (since *Shetty*) do not support this view. The courts have generally required that there be a suggestion in the prior art that would have made obvious not only the chemical structure but also the newly discovered property of a new chemical compound or composition, in order to make a *prima facie* case under section 103.

In *In re Geiger*, 815 F.2d 686, 2 USPQ2d 1276 (Fed. Cir. 1987) the Federal Circuit held that although the prior art disclosed the separate components of the claimed new compositions, for the same general use of

treating cooling water systems, a *prima facie* case was not established "absent some teaching, suggestion or incentive supporting [*714] the combination". The court held that:

Because we [**87] reverse on the basis of failure to establish a *prima facie* case of obviousness, we need not reach the issue of the sufficiency of the showing of unexpected results.

Id. at 688, 2 USPQ2d at 1278.

In *In re Chupp*, 816 F.2d 643, 2 USPQ2d 1437 (Fed. Cir. 1987) the applicant did not challenge the board's holding that a new compound useful as a herbicide was *prima facie* obvious in view of the prior art showing of an adjacent homolog and other structurally similar compounds used as herbicides. However, the court found the rebuttal evidence of differences in selectivity sufficient to hold the composition claims allowable. *Id.* at 647, 2 USPQ2d at 1440.

In *Chupp* the court disposed of the Commissioner's policy argument that grant of the composition claims would prevent the public from using Chupp's structurally obvious compound for the herbicidal uses shown in the prior art, with the remark that "the expectation that persons would want to use the compound to produce inferior results (or would want to fight lawsuits over such uses) is false." *Id.* at 647, 2 USPQ2d at 1440.

The Federal Circuit has [**88] not applied the standard of *prima facie* obviousness that the majority today "reaffirms", but has consistently considered properties and use as well as structure. The only decision referred to by the majority is *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988), as if *Wright* stood alone in its requirement that the inventor's desired properties and use must be considered. *Wright* dealt with a mechanical device, and is in the mainstream of this precedent. In *Wright* we said:

The determination of whether a novel structure is or is not "obvious" requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art.

Id. at 1219, 6 USPQ2d at 1361 (citations omitted). Not one of the myriad cases wherein the courts had required consideration of these factors is mentioned or distin-

guished by the majority, although presumably *all* are now overruled. In this already-lengthy survey I have not included mechanical cases whose rationale is stated in the same terms as that of *Wright*.¹⁷ Nonetheless the *in banc* court today overrules *Wright* [**89], without argument or briefing, and extends to mechanical devices the [*715] same theory of structural obviousness that the court now applies to chemicals, discarding the extensive precedent to the contrary.

17 *Wright* claimed a new carpenter's level, having the new property and use of enhanced pitch measurement. *Wright*'s new structure was a combination of elements that were in the prior art, but there was no suggestion in the prior art that this new combination might have the property and use discovered by *Wright*. The panel explained that it was unobvious to make this combination to solve the problem of increasing pitch measurement: a rationale appearing in dozens of decisions. See, e.g., *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984) ("Nothing in the references alone or together suggests the claimed invention as a solution to the problem of crushing rigidly massive scrap"); *In re Benno*, 768 F.2d 1340, 1347, 226 USPQ 683, 687 (Fed. Cir. 1985) ("[Benno] had to invent a solution to that problem. . . . Neither reference hints at his solution"); *Weather Engineering Corp. of America v. United States*, 614 F.2d 281, 287, 204 USPQ 41, 46-7 (Ct. Cl. 1980) ("The near unanimous approach by the courts is that 'the prior art that is relevant in evaluating a claim of obviousness is defined by the nature of the problem confronting the would-be inventor'"); *In re Naber*, 494 F.2d 1405, 1407, 181 USPQ 639, 641 (CCPA 1974) ("even if one of ordinary skill in the art were moved to combine the references, there would be no recognition that the problem of combustible deposits had been solved"); *In re Aufhauser*, 55 C.C.P.A. 1477, 399 F.2d 275, 281, 158 USPQ 351, 355 (CCPA 1968) ("as in *United States v. Adams*, 383 U.S. 39, 86 S. Ct. 708, 15 L. Ed. 2d 572 (1966), what appellant had done was to observe an existing problem in the art which had not been solved by the prior art and then combine individually old concepts to solve that problem") (emphasis in original); *In re Rothermel*, 47 C.C.P.A. 866, 276 F.2d 393, 125 USPQ 328, 331 (CCPA 1960) ("Where the invention for which a patent is sought solves a problem which persisted in the art, we must look to the problem as well as its solution if we are to properly appraise what was done and to evaluate it against

what would be obvious to one having the ordinary skills of the art."); *In re Ratti*, 46 C.C.P.A. 976, 270 F.2d 810, 813, 123 USPQ 349, 351 (CCPA 1959) (the prior art did not teach "how to solve the problems" faced by the inventor).

Many other decisions apply similar reasoning, contrary to the majority's holding today.

[**90] The Court stated in *Thomas v. Washington Gas Light Co.*, 448 U.S. 261, 272, 100 S. Ct. 2647, 65 L. Ed. 2d 757 (1980):

When rights have been created or modified in reliance on established rules of law, the arguments against their change have special force.

At least, the majority should explain its reasoning for so far-reaching a change of law and practice, affecting patentability of mechanical devices as well as chemical compounds and compositions.

D

The Statute

The court's *in banc* holding that similarity of chemical (and mechanical) structure suffices for *prima facie* unpatentability under 35 U.S.C. § 103, even when the applicant's newly discovered properties and use are not suggested in the prior art, departs from the precepts of not only section 103, but also sections 101 and 102. The court today imposes the same rebuttal burden on the applicant regardless of whether the prior art suggests the applicant's newly discovered properties.

35 U.S.C. § 103 requires that obviousness be determined in light of the prior art; section 102 fixes the limits of prior art; and section 101 requires [**91] utility as a condition of patentability. Giving consideration to the newly discovered properties and utility as well as the structure of a new chemical compound or composition (or a new device) implements the requirement of section 103 that the invention be viewed as a whole. *Jones v. Hardy*, 727 F.2d 1524, 1529, 220 USPQ 1021, 1025 (Fed. Cir. 1984) ("Failure to consider the claimed invention as a whole is an error of law"); *In re Kuehl*, 475 F.2d 658, 664-65, 177 USPQ 250, 255 (CCPA 1973) ("The test under § 103 is whether in view of the prior art the invention as a whole would have been obvious at the time it was made"). As the court remarked in *Lunsford*, it is unlikely that a person of ordinary skill would consider only the structures, and not the properties, described in the prior art.

The factual determination of the scope and content of the prior art, see *Graham*, 383 U.S. at 17, 148 USPQ at 467, is, of course, directed to prior art that meets the conditions of section 102. Section 102 describes prior art as what is published or otherwise known, including subject matter in public use or on sale. Not included is what is [**92] unknown, or knowledge that became known to the inventor through the inventor's own research:

To rely on an equivalence known only to the applicant to establish obviousness is to assume that his disclosure is a part of the prior art. The mere statement of this proposition reveals its fallaciousness.

In re Ruff, 45 C.C.P.A. 1037, 256 F.2d 590, 598, 118 USPQ 340, 347 (CCPA 1958) (emphasis in original). Indeed, this principle was recently modernized by Congress in 35 U.S.C. § 103, second paragraph (1984) (prior art does not include certain information of common ownership). When the prior art does not suggest that similar structures will have the property and use that the inventor discovered, such fact can not be used to support rejection of the claims, even when the inventor included such information in the patent application.

35 U.S.C. § 101 requires that an invention be useful. The use of a chemical is the utilitarian property of that chemical. Since the essence of the *prima facie* case is that the holding of unpatentability is legally complete, the property and utility can not be ignored. Consideration [**93] of the utility of the claimed invention is as integral to the examiner's determination of *prima facie* unpatentability as it is to the decision after any rebuttal evidence is submitted.

The decisions I have discussed, and many others, illustrate the breadth of the court's exposure and the depth of the court's understanding, evolved over more than thirty years of application of these statutory principles. The weight of precedent, well exceeding the sampling I have reported, contradicts the majority's holding, and has established powerful legal principles that should not be discarded without sound [**716] reason. As discussed by the Supreme Court in *Vasquez v. Hillery*, 474 U.S. 254, 265, 106 S. Ct. 617, 88 L. Ed. 2d 598 (1986),

stare decisis [is] the means by which we ensure that the law will not merely change erratically, but will develop in a principled and intelligible fashion. That doctrine permits society to presume that bedrock principles are founded in the law

rather than in the proclivities of individuals. . . .

The law of *prima facie* obviousness had developed over a long history, knitting the common threads of many carefully [**94] considered cases, leading to unifying criteria, in the tradition of the common law.

The court has made the wrong choice in reviving the *Hass-Henze* presumption of obviousness based on chemical structure without consideration of the obviousness of the applicant's new properties. This presumption was criticized, limited, and overruled, and has been superseded by judicial appreciation that a chemical "is, realistically and legally, a composite of both structure and properties", in the words of *Papesch*. I repeat the unifying criterion that for a new chemical compound or composition a *prima facie* case of obviousness is made when both (1) the new compound or composition is of closely related chemical structure to the prior art compound or composition, and (2) there is some suggestion or motivation arising in the prior art to make the new compound or composition in order to achieve the inventor's desired properties and utility. When these requirements were met, appropriate evidentiary showings could rebut the *prima facie* case. Only an occasional exception among past decisions eliminated the second part of this unifying criterion, and required proof of actual differences in [**95] properties when there was no suggestion in the prior art of the properties discovered by the inventor. Today the aberration becomes the law, reversing over thirty years of reasoned legal analysis.

The court does not state what new statutory interpretation is invoked, what new policy or principle is served, by rejecting the reasoning of so many decisions. The Supreme Court has remarked that

any detours from the straight path of *stare decisis* in our past have occurred for articulable reasons, and only when the Court has felt obliged "to bring its opinions into agreement with experience and with facts newly ascertained."

Vasquez, 474 U.S. at 266 (quoting *Burnet v. Coronado Oil & Gas Co.*, 285 U.S. 393, 412, 52 S. Ct. 443, 76 L. Ed. 815 (1932) (Brandeis, J., dissenting)). When our court makes so dramatic a change of law, its *ratio decidendi* should be made known.

II

DILLON'S INVENTION

Dillon's patent application discloses and claims her discovery that the inclusion of certain tetra-orthoester compounds in hydrocarbon fuel compositions will reduce the emission of solid particulates (*i.e.* soot) during combustion of [**96] the fuel. The tetra-orthoesters are a known class of chemical compound. It is undisputed that their combination with hydrocarbon fuels, for any purpose, is not described in the prior art; nor is their use to reduce particulate emissions from combustion of hydrocarbon fuels.

A

Dillon's Appeal to the Board

An applicant is required to appeal from all of the examiner's rejections that the applicant wishes to contest. 37 C.F.R. § 1.191(c). Dillon did so, and appealed the rejection of claims 2-14, 16-22, and 24-37. Of these, claims 24-35 were process (use) claims and the others were composition claims. The appealed rejections were directed to the process and composition claims together, and were described by the board as follows:

1. Claims 24 through 37 under 35 U.S.C. 112, second paragraph.

2. Claims 2 through 14, 22 and 34 through 37 under 35 U.S.C. 103 as unpatentable over Sweeney '417 in view of Elliott, Howk, Kesslin, Speh, and Neves. [**717]

3. Claims 16 through 22, 24 through 33, 35, 36 and 37 under 35 U.S.C. 103 as unpatentable over Sweeney '267 or '417 in view of Elliott, Howk, [**97] Kesslin and Speh.

Board op. at 2. In its decision the board wrote that composition and method of use claims were at issue:

The appealed subject matter relates to compositions comprising a hydrocarbon fuel and a particulate emissions suppressing amount of an organic orthoester, and a method of reducing particulate emissions by combusting such compositions.

Board op. at 1.

Dillon duly argued each ground of rejection, in accordance with 37 C.F.R. § 1.192, and the examiner responded. The board reversed the examiner's rejection on *section 112*, for all the claims rejected on that ground, and affirmed the rejections on *section 103*, for all the

claims rejected on that ground. Each ground encompassed composition and process claims, without distinction. (The board also discussed claims 13, 14, 34, 36, and 37, as to aspects not here material.)

Analyzing all the claims with respect to *section 103*, the board did not distinguish among them. For example, the board stated that

differences between appellant's and the prior art's motivation for adding a component to a composition will not alone render the claimed *composition*, or *process* unobvious.

[**98] Board op. at 7 (emphasis added). The board further stated, again as to all the claims, that

The mere recitation of a newly discovered function inherently possessed by *things and processes* in the prior art does not cause claims drawn thereto to distinguish over that prior art.

Board op. at 8 (emphasis added). Throughout its opinion the board did not imply that its analysis was directed solely to the composition claims. Indeed, the board stated that

the *use* of the orthoesters recited in the appealed claims (wherein R is -OR) as hydrocarbon fuel additives would clearly have been *prima facie* obvious from the teachings of the Sweeney patents alone and the close chemical and structural relationship between Sweeney's and appellant's orthoesters[.]

Board op. at 6 (emphasis added). The majority errs in its statement that the board "reviewed only the composition claims". The board considered and rejected all the claims, drawing no distinction as to the style of the claim.¹⁸

18 The process claims were written in the style required by 35 U.S.C. § 100(b), see n.15, *supra*. As explained in *In re Moreton*, 48 C.C.P.A. 875, 288 F.2d 708, 709, 129 USPQ 227, 228 (CCPA 1961), "this mere matter of form [i.e., claiming a new use as a process] should have no effect on patentability".

[**99] The rejection of all of the claims was appealed to us. The Commissioner has not argued otherwise, and both sides briefed and argued all the claims. As

stated in the Commissioner's brief, the issue on appeal is whether "The claimed subject matter would have been *prima facie* obvious from the combined teachings of the references." Thus I must dissent from the court's affirmation of the board's rejection of the process claims simply because Dillon did not argue that the process claims are patentable even if the composition claims are not.

B

In re Durden

Before this court, Dillon properly did not discuss points that had not been raised by the examiner or the board. Since there had been no reliance on the law of *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), and neither the examiner nor the board cited *Durden*, Dillon did not discuss the law of *Durden*.

The Commissioner, in his answering brief before the Federal Circuit, argued for the first time that *Durden* provided additional authority for upholding the board's rejection of the process claims. The Commissioner stated that if the court decided to [*718] reverse the board's holding [*100] of unpatentability, the court should consider the effect of *Durden*. The panel, having reversed the board's holding, thus considered *Durden*, as the Commissioner requested; the panel simply observed that *Durden* does not apply to "use" claims.

However, the majority of this court, having affirmed the rejection of all the claims, has no basis for review on additional authority. Thus I can not join the majority's opinion interpreting *Durden*, for it is, in the event, *dictum*.

C

The Merits

Applying the guidance of precedent to Dillon's invention: the compositions are new,¹⁹ and their property and use of reducing particulate emissions is not taught or suggested in the prior art. There is no objective teaching in the prior art that would have led one of ordinary skill to make this product in order to solve the problem that was confronting Dillon: to reduce soot from combustion of hydrocarbon fuels. There is no reasonable basis in the prior art for expecting that Dillon's new compositions would have the particulate-reducing property that she discovered. As shown in Part I, *ante*, structure, properties and use must be considered in determining whether a *prima facie* [*101] case under *section 103* has been made.

19 If a compound or composition is known, for any use or no use, it is not patentable. 35 U.S.C. § 102; *Titanium Metals Corp. v. Banner*, 778

F.2d 775, 780, 227 USPQ 773, 777-78 (Fed. Cir. 1985).

The Sweeney references show the water-sequestration property of tri-orthoesters in hydrocarbon fuels, and the Elliott reference shows the water-sequestration property of tri- and tetra-orthoesters in hydraulic fluids (which are not hydrocarbons and not fuels). There is no suggestion in the prior art that would have led one of ordinary skill to make Dillon's new compositions in the expectation that they would reduce particulate emissions from combustion. No reference suggests any relationship between the properties of water-sequestration and soot-reduction. All this is undisputed.

Dillon raises the question of whether the Sweeney and Elliott references²⁰ are properly combinable, arguing that they are not in analogous arts. [**102] This question need not be decided, for even when combined these references offer no suggestion of the property of reducing particulate emissions from combustion. *In re Naber*, 494 F.2d 1405, 1407, 181 USPQ 639, 641 (CCPA 1974) ("even if one of ordinary skill in the art were moved to combine the references, there would be no recognition that the problem of combustible deposits had been solved").

20 The Board held that all the references other than Sweeney and Elliott were "merely cumulative", and did not discuss the Howk reference, on which the majority apparently now relies.

The board stated that it is inherent in Dillon's compositions that they would reduce particulate emissions, that Dillon "merely recited a newly discovered function inherently possessed" by the prior art. Arguments based on "inherent" properties can not stand when there is no supporting teaching in the prior art. Inherency and obviousness are distinct concepts. *In re Spormann*, 53 C.C.P.A. 1375, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966): [**103]

The inherency of an advantage and its obviousness are entirely different questions. That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.

When the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, the PTO must produce supporting references. *In re Yates*, 663 F.2d 1054, 1057, 211 USPQ 1149, 1151 (CCPA 1981).

The applicant's newly discovered properties must be considered in determining whether a *prima facie* case of unpatentability is made, along with all the other evidence. Neither structure nor properties can be ignored; they are essential to consideration of the invention as a whole. But Dillon's own discovery of the soot-reducing [*719] property of the tri-orthoester fuel composition is not evidence against her in determining whether the prior art makes a case of *prima facie* obviousness. *In re Wertheim*, 541 F.2d 257, 269, 191 USPQ 90, 102 (CCPA 1976) (applicant's own disclosures can not be used to support a rejection of the claims "absent some admission that matter disclosed in the specification is in the prior art"); [**104] *In re Ruff*, 256 F.2d at 598, 118 USPQ at 347 ("The mere statement of this proposition reveals its fallaciousness").

The board cited *In re Merck*, 800 F.2d at 1097, 231 USPQ at 379, in arguing that obviousness does not require absolute predictability. Obviousness does, however, require a sufficient relationship between the use taught in the reference and the use discovered by the applicant. In *Merck* the reference compound and the claim compound were both known to have psychotropic properties, supporting the holding of *prima facie* obviousness of the claimed specific antidepressant use. Applying this reasoning to Dillon's claims leads to the opposite conclusion, for Dillon's use to reduce soot from combustion is not suggested by the known use of the prior art compositions to scavenge water. (Only "use" claims were present in *Merck* -- again illustrating that the board, citing *Merck* against Dillon's claims, did not distinguish between composition and use claims in its analysis of Dillon's invention.)

In view of the complete absence of any suggestion in the prior art that Dillon's new compositions would have her newly discovered and unobvious [**105] property and use of soot reduction, I would reverse the rejection of the composition and the use claims.

The Commissioner raised the policy argument that Dillon is simply removing from the public an obvious variant of Sweeney's and Elliott's compositions, one that might be useful to scavenge water in fuels. In *Ruschig* the court had considered the argument, and remarked that the provision of adequate patent protection for the applicant's new compounds, not previously in existence and having a new and unobvious use, was favored over the "mere possibility that someone might wish to use some of them for some such [other] purpose". 343 F.2d at 979, 145 USPQ at 286. See also, e.g., *Chupp*, 816 F.2d at 647, 2 USPQ2d at 1440, wherein the court expressed a similar view. This practical wisdom has been tested by long experience. It accords with judicial recognition that:

Although there is a vast amount of knowledge about general relationships in the chemical arts, chemistry is still largely empirical, and there is often great difficulty in predicting precisely how a given compound will behave.

In re Carleton, 599 F.2d 1021, 1026, 202 USPQ 165, 170 (CCPA 1979). [**106]

Granting Dillon a patent on her invention takes away nothing that the public already has; and the public receives not only the knowledge of Dillon's discovery, for abandoned patent applications are maintained in secrecy, but Dillon is not deprived of an incentive to discover and to commercialize this new product for this new use.²¹

21 The majority remarks that Dillon made "no attempt to argue the relative importance" of soot reduction and water sequestration. This dramatic new criterion, although presented in the *amicus* brief of the American Intellectual Property Law

Association, should not be approved by this *in banc* court without discussion.

Conclusion

Following the weight of precedent, I would hold that a *prima facie* case of obviousness of a new chemical compound or composition requires consideration of not only the chemical structure but also the newly discovered properties, in light of the teachings and suggestions of the prior art. I would expressly reject the Commissioner's position [**107] that determination of the *prima facie* case is made regardless of the properties disclosed in the inventor's application.

Since there is no suggestion in the prior art references, alone or in combination, of the particulate-reducing property and use discovered by Dillon for her new compositions, a *prima facie* case of obviousness has not been made. Thus it is not necessary to patentability that Dillon establish [*720] that the prior art compositions do not possess the same soot-reduction property and use. I would reverse the board's rejection of claims 2-14, 16-22, and 24-37, all of the claims before us on appeal.

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